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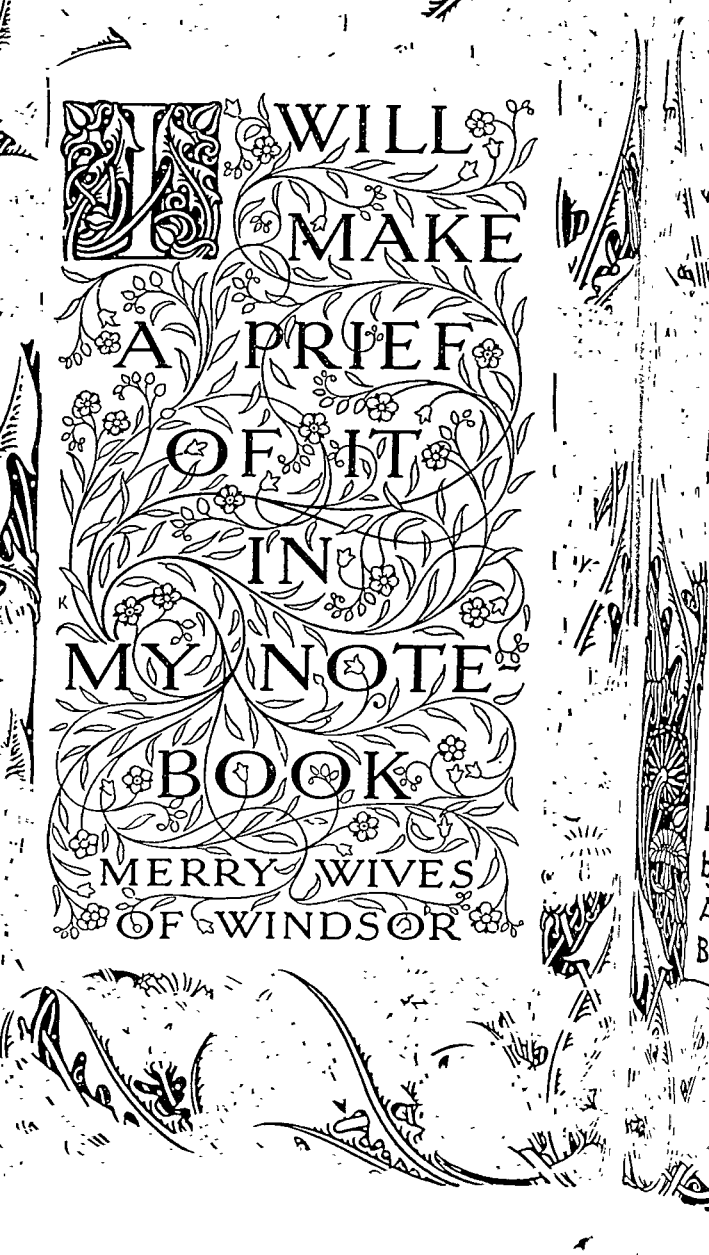
THE
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EDITED BY ANDREW BOYLE
VOLUME TWO

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I WILL
MAKE
A PRIEF
OF IT
IN
MY NOTE
BOOK
MERRY WIVES
OF WINDSOR

THE EVERYMAN ENCYCLOPÆDIA

EDITED BY ANDREW BOYLE

VOLUME 2

BAC–BRI



LONDON: PUBLISHED
by J. M. DENT & SONS LTD
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BY E. P. DUTTON & CO

LIST OF ABBREVIATIONS

ac., acres.
A.D., after Christ.
agric., agricultural.
alt., altitude.
ambas., ambassador.
anct., ancient.
ann., annual.
arron., arrondissement.
A.-S., Anglo-Saxon.
A.V., Authorised Version.
b., born.
B.C., before Christ.
Biog. Dict., Biographical Dictionary.
bor., borough.
bp., birthplace.
C., Centigrade.
c. (*circa*), about.
cap., capital.
cf., compare.
co., county.
com., commune.
cub: ft., cubic feet.
d., died.
Dan., Danish.
dept., department.
dist., district.
div., division.
E., east; eastern.
eccles., ecclesiastical.
ed., edition; edited.
e.g., for example.
Ency. Brit., Encyclopædia Britannica.
Eng., English.
estab., established.
et seq., and the following.
F., Fahrenheit.
fl., flourished.
fort. tn., fortified town.
Fr., French.
ft., feet.
Ger., German.
Gk., Greek.
gov., government.
Heb., Hebrew.
Hist., History.
i.e., that is.
in., inches.
inhab., inhabitants.
Is., island, -s.
It., Italian.
Jour., journal.
Lat., Latin.
lat., latitude.
l. b., left bank.
lit., literally.
long., longitude.
m., miles.
Mag., Magazine.
manuf., manufacture.
mrkt. tn., market-town.
Mt., mts., mount, mountain, -s.
N., north; northern.
N.T., New Testament.
O.T., Old Testament.
par., parish.
parl., parliamentary.
pop., population.
prin., principal.
Proc. Royal Geog. Soc., Proceedings of the Royal Geographical Society.
prov., province.
pub., published.
q.v., which see.
R., riv., river.
r. b., right bank.
Rom., Roman.
R.V., Revised Version.
S., south; southern.
sev., several.
Sp., Spanish.
sp. gr., specific gravity.
sq. m., square miles.
temp., temperature.
ter., territory.
tn., town.
trans., translated.
trib., tributary.
U.S.A., United States of America.
vil., village.
vol., volume.
W., west; western.
yds., yards.

Backhuysen, Ludolph (1631-1708), Dutch painter, born at Emden, Hanover. His masters were Everdingen and Dubbels. He is famous as a painter of seascapes, which are marked by their vivid realism.

Back-lash, the jarring reaction when the motion of a cogwheel or set of connected wheels is altered or when sudden pressure is applied.

Backnang, a tn. of Würtemberg, Germany, on a trib. of the Neckar. It has tanneries, and manufs. boots and cloth. Pop. 7500.

Backwardation, a term used on the Stock Exchange for a sum of money paid by a seller of stock to the buyer in order that he may delay its delivery until the following account.

Backwell, Edward (*d.* 1683), a London goldsmith and banker at Unicorn, Lombard Street, one of the founders of the system of bank-notes. He had financial dealings with Oliver Cromwell, Charles II., and the queen-mother, most of the nobility of the day, and with the E. India Company and sev. leading city firms. In 1662 he was sent to Paris on the matter of the sale of Dunkirk, and was employed on many secret services between Charles II. and Louis of France.

[illegible]

prov. of Bac-Ninh, is in Tong-king, about 16 m. N.E. of Hanoi. It was captured by the Chinese in 1884; pop. 8000.

Bacolod, or **Bacolot**, former cap. of Negros, Philippine Is., now of the prov. of W. Negros. It is noted for its fishing; pop. 12,000.

Bacolor, a tn. of the prov. of Pampanga in the is. of Luzon, Philippine Is., situated 40 m. N.W. of Manila. The is. grows spice, and has a pop. of about 10,000.

Bacon, *see* PORK.

Bacon, a tn. on the W. coast of the Camarines Isthmus, Luzon, Philippine Is., in a fertile dist.; pop. 13,000.

Bacon, Anthony (1558-1601), a diplomatist, elder son of Sir Nicholas B., and brother of the great Francis B. In 1573 he went into residence at Trinity College, Cambridge, his tutor being John Whitgift, afterwards archbishop of Canterbury; in 1576 he was admitted with his brother 'ancients' of Gray's Inn. In 1579 he undertook a long continental tour, when he made the acquaintance of Montaigne, the essayist, Danæus, an eminent Protestant theologian, and many of the leaders of the court of Henry of Navarre. He returned to England in very bad health in 1591. In 1592-3 he was returned to parliament as member of Wallingford. In 1593 he entered the service of the Earl of Essex, and undertook to keep him posted in foreign information, and as his private 'Under-Secretary of State for Foreign Affairs,' was in constant communication with numerous foreign ambas. Many of Bacon's letters remain in manuscript, much of which is preserved in Lambeth Palace Library. In 1597 he was returned to parliament as member for Oxford. *See* Dr. Abbot's *Bacon and Essex*, 1877; Todd's *Cat. Lambeth MSS.*

Bacon, Delia (1811-59), an American authoress, sister of Leonard B., born at Tallmadge, Ohio; a schoolmistress, and a lecturer in history and literature at classes for women. Wrote sev. stories: *Tales of the Puritans*, 1831; *Bride of Fort Edward*, 1839. Though the idea did not originate with her, she was one of the earliest and most enthusiastic supporters of the theory that Shakespeare was not the writer of the plays called by his name. She came to England to study the question, and became a friend of Thomas Carlyle and Nathaniel Hawthorne. In 1857 she pub. *Philosophy of the Plays of Shakespeare Unfolded*, in which she expounded her theory that the so-called Shakespeare plays were written by Francis Bacon, Edmund Spenser, Walter Raleigh, and others in order to set forth a philosophy which, nevertheless, they did not care to own publicly. Her mind became unhinged, and she returned to America, and died at Hartford (Conn.). Hawthorne recounted his friendship with her in a chapter of *Our Old Home*, (1863), 'Recollections of a Gifted Woman.'

Bacon, Francis (1561-1626), Lord Verulam and Viscount St. Albans, commonly but inaccurately called Lord B.; lord chancellor and philosopher, was born at York House in the Strand, London, Jan. 22. His father was Lord Keeper Nicholas B., who ranks high among great Elizabethan statesmen, and who held the seals of office for twenty years. His mother was Ann, second daughter of Sir Anthony Cooke, a well educated woman and a zealous Calvinist. In 1573 Francis entered Trinity College, Cambridge, and in 1575 Gray's Inn.



FRANCIS BACON

It is said that while he was still at college he determined upon pursuing that course which should bring about the new philosophy. It is said that he himself regarded his profession as a means to this end. However, the death of his father in 1580 left him with comparatively little influence, and so he was dependent upon patronage. Henceforth his life must be considered in two aspects: the political career and the literary, both so distinct and contradictory that, to a casual observer, it seems that Pope's saying is suitable to him. 'The brightest, wisest, meanest of mankind.'

After failing to obtain help from his uncle, Lord Burleigh, he was helped very considerably by the Earl of Essex, whose unfortunate career in Ireland terminated too quickly to allow of his giving B. very much help.

Now occurs the period of which the most capital has been made by B.'s enemies. He had to manage the queen and Essex; he evidently did attempt to mediate honestly between them. But this having failed, what is certain is that he offered himself as counsel for the prosecution against Essex. He himself said in his *Apology* that he did so in the hope of helping his unfortunate patron. What was more generally believed was that he saw that he had gone too far, that he had offended the queen, that the fall of Essex meant his own ruin, and so he altered his plans accordingly. He made little attempt to save his friend. Moreover, when the queen wished to vindicate her action, it was B. who wrote *A Declaration of the Practices and Treasons attempted and committed by Robert, Earl of Essex*, and later apologised by saying that the maintenance of the state was more important than the ties of friendship. In the last years of Elizabeth's reign B. tried to act the part of mediator between queen and people. With the accession of James he found his chances of promotion increased. He was knighted on coronation day, and in the same year married Alice, daughter of Alderman Barnham. In 1604 he was made a king's counsel, and given a pension of £60 a year. In 1607 he became Solicitor-General, and in 1612 Attorney-General. He exerted himself to bring about the union of England and Scotland, and at the same time busied himself in writing. His servility during this period is usually illustrated from the cases of St. John and Reacham. In 1616 B. was the prosecuting counsel in the Overburg murder case, and next year secured the dismissal of Coke, his rival, from the King's Bench. He next attached himself to the new favourite, Buckingham, who at first did his best by using his influence on behalf of B. In 1616 B. became a Privy Councillor, and in 1617 was appointed Keeper of the Great Seal, and was raised to the peerage as Lord Verulam. The years in which he held office Macaulay declares among the darkest and most shameful in our history. He allowed Buckingham to interfere in his decisions in the Court of Chancery, and at one time actually cancelled his judgment of a case and ordered it to be tried again in response to a peremptory letter from Buckingham. He acquiesced in the execution of Raleigh, and in the project of a Spanish marriage. A great deal of the maladministration of the time must be ascribed to the weakness of the king and the power of the favourite. But it is impossible to exonerate the lord keeper. At this time the practice of granting monopolies as rewards was at its height.

Patentees were armed with such great powers that they could over-ride all law and order. But B., when he was asked to interfere, practically decided in favour of extending these powers. However, his fall was close at hand. The period of the Addled Parliament of 1614 had been succeeded by seven years in which the nation was governed absolutely by the Crown. In 1621 want of money forced the king to convoke another parliament. If he and his ministers had understood the temper of the people it is possible that they would not have done so. Immediately parliament assembled, the Commons proceeded in the most reasonable manner to discuss the granting of monopolies, under cover of which Buckingham and his friends had so oppressed and robbed the people. Buckingham began to fear for himself, and so proposed a plan by which certain people were to be sacrificed to the house to save others. Sir Giles Mompesson and Sir Francis Mitchell were first given over to impeachment. It was not long before B. understood that he, too, was to be abandoned. The Commons, led by B.'s enemy, Coke, appointed a committee to enquire into the state of the courts of justice. On March 15, 1621, the chairman reported that great abuses had been discovered. 'The person,' said he, 'against whom these things are alleged is no less than the lord chancellor, a man so endued with all parts, both of nature and of art, that I will say no more of him, being not able to say enough.' There were twenty-three specific charges which were put before the Lords temperately enough. The evidence was so clear and irrefutable that the lord keeper's friends could only ask for suspension of judgment. B. himself seems to have realised the hopelessness of his position. He became ill, and from a letter written at the time he seems to have had no wish to recover. The inquiry was proceeding when the adjournment of parliament gave him a short respite. On the reassembly of the houses B. admitted practically everything, and renounced all defence. He was condemned to pay a fine of £40,000, and to be imprisoned during the king's pleasure. He was removed from his offices, declared incapable of holding any other, and banished from court. The sentence was undoubtedly severe, but probably none of the judges thought it would be carried out in its entirety. B. was indeed imprisoned in the Tower for two days as soon as his health improved, but at the beginning of 1624 he received a full pardon. The argument that such bribes and fees were the customary emoluments of the law officers of the day, and that therefore B. was simply used as a scapegoat cannot be admitted for a moment if we consider B.'s own view of the matter. True, at first he denied all the allegations with great indignation. But later, when he found himself deserted by his powerful friends, the king and the favourite, his attitude shows clearly his own condemnation of himself. Not once does he hint that presents are the same thing as fees. He never attempted to defend himself now, as he had done in the prosecution of Essex. In his final 'confession and submision' he goes over all the charges, and, with the exception of a few unimportant denials, declares himself guilty. 'I do plainly and ingenuously confess that I am guilty of corruption, and do renounce all defence and put myself upon the grace and mercy of your lordships;' and again, at the end, when he had stated all he could in favour of himself, 'I do now again confess that, in the points charged upon me, though they should be taken as I have declared them, there is a great deal of corruption and neglect, for which I am heartily sorry, and submit myself to the judgment, grace, and mercy of this court. For extenuation I will use none concerning the matter themselves.' The most remarkable comment on his case and on the state of the courts in England is his own statement, made some years later, 'I was the justest judge that was in England these fifty years; but it was the justest judgment that hath been pronounced these two hundred years.' No judges could have been more favourable to him than those who tried him. He was spared all public humiliation as far as possible. After 1624 he was at full liberty to return to court, and even to take his seat in the Lords, had he desired to do so. He received a pension of £1200 from the gov., and his magnificence was as great as ever. This carelessness in money matters may explain some of the passages in his confession; it is certain that it brought him into difficulties during the last years of his life. He was forced to sell York House, and to live at Gray's Inn while in London. Yet, during these years he rendered such services to letters that the world must regret the years that had been wasted as Sir Thomas Bodley said, 'on such study as was not worthy of such a student.' In 1622 he completed his *History of King Henry VII.*, and in 1623 his *De Augmentis*, and in 1625 the best collection of jests in the world, *Apophthegms New and Old.* Sev. political tracts and valuable additions to what he had already

written were the product of this part of his life. In 1626, while travelling in his coach near Highgate, he caught a chill while performing an experiment. He considered that excessive cold might serve to prevent animal tissues from *putrefaction*. On this particular day he alighted from his coach to stuff a fowl with snow in order to test his theory. Almost immediately he became ill and was taken to the Earl of Arundel's house. Here he died on Easter Day.

It is by the *Essays* that B. is best known to the general reader. First pub. in 1598 they appeared as ten in number; later, as successive eds. were issued, they became more; in 1612 they were nearly four times as many, and in 1625, the last ed. pub. during his lifetime, nearly six times as many. These *Essays* differ greatly from his later works. They are simply observations he had made, and rules he had found to be true, in his way through life, and are set down unceremoniously. There is hardly any attempt after 'style;' in few is there any deliberate seeking after order. In 1598 they read almost like notes, and although they are recast later the same ruggedness of outline remains. For what is considered his greater work he had a different manner of writing. As far as subject matter, truth, and beauty are concerned he rarely surpassed the *Essays*, but his style was becoming constantly richer, softer, and more melodious. In 1605 he dedicated to the king *Two Books of the Proficience and Advancement of Learning, Divine and Human*. In 1623 he expounded this into the Lat. treatise, in nine books, entitled *De Augmentis Scientiarum*. In 1610 he gave to the world his *Wisdom of the Ancients* (*De Sapientia Veterum*), a fanciful interpretation of old classical mythology, but none the less a brilliant piece of work. In 1620, just before his fall, appeared what is undoubtedly the greatest of his works, the two books of his *Novum Organum Scientiarum*, or new method of scientific discovery, in which he announced what he thought to be a previously unthought of method of questioning nature, and extorting her secrets from her. This work was to be the second part of a great scheme, 'Instauratio Magna,' or the Great Restoration, *De Augmentis* being the first, the whole to be completed in six books. In 1622 he pub. the *History of the Reign of King Henry VII.*, and, as before stated, his marvellous industry continued to the end. Of these books, the *Advancement* must be considered as a call to a great cause. It is evidently a hurried production, and is not well arranged. Yet it is a work whose purpose was immense, whose influence is even now at work. It was the first of a long line of books, the purpose of which was to teach people the use of knowledge, how, why, and what to know. B. considered it merely a beginning; the *De Augmentis* was a development of it, and in his later Lat. works he sought to go farther in the road he pointed out first of all. In the *Novum Organum* he reverted to the form of aphorisms. He worked twelve years on this book, and carefully weighed every word. It developed into a war on the world of science as it was then; and declared that all knowledge must be begun again, by a new, and as he thought, infallible method. The first book simply prepares; in the second book, with the eleventh aphorism, he declares his own method. It is usually said, mistakenly, that he rediscovered the method of induction as opposed to that of deduction. The method of reasoning then in vogue had been to accumulate instances without following any rule of selection; that is, a theory was formed, and then was supposed to be proved if instances could be accumulated which agreed with the theory. B. on the other hand, pointed out the advantages of the experimental method. Given an effect, work backwards to the cause or causes; experiment then to discover if the cause produces the effect. B. elaborated this method of exclusions, but, as Macaulay points out, it is ridiculous to say that he discovered the method of induction. Intrinsically, his method was valuable. He saw that the real object of science should be to find out causes, or the force of causation. He has received much credit for this. The amazing discoveries of modern science are, not without reason perhaps, assigned to his awakening. But when we come to examine details we find that the most surprising divergence of opinion exists among competent judges. Some of his most ardent admirers have come to the conclusion that as an instrument and real method of work B.'s plan was a failure. B. claimed that his method was infallible and mechanical, and that it would reduce all minds to the same level in the task of obtaining knowledge. To have made such an assertion shows that he could never have understood the possibilities of the human mind. Again, his explanation of the science of induction is not clear enough to be satisfactory. His own conclusions are either unverified or merely negative. His conception of the meaning of philosophy was altogether too narrow, embracing as it did merely the

natural sciences. Finally, his method was altogether too mechanical.

Yet with all this he has a pre-eminent place in the history of science. The principles on which he worked were the only true ones, and he propounded them systematically and earnestly. He showed that intelligent, patient examination of things was the only way to knowledge. He wished to make a new world, happier than the old in the possession and pursuit of knowing. He was keenly alive to the needs and pains of human life, and thought it no shame to use knowledge to alleviate them, in 'charity to man, and anxiety to relieve his sorrows and necessities . . . for this should men study to be perfect in.' Certain it is that his conclusions were often vague and untrue; that he himself did not know the immensity of what he aimed at; equally certain is it that he expressed what had broken in on other minds before in such terse, beautiful language that men were bound to answer the call and follow the gleam. Unfinished though his great scheme of the Restoration was, yet the *Novum Organum* was a worthy crown. He had intended much more, and there remains a vast amount of unused or neglected material which shows how it was thought out, arranged, and recast. It was written and re-written twelve times over before its publication. Mr. Ellis says that the scheme for the *Instauratio Magna* was as follows: 'The first book contains a general survey of the present state of knowledge; in the second men are to be taught how to use their understanding; in the third all the phenomena of the universe are to be stored up . . .; in the fourth examples are to be given of its operation . . .; the fifth is to contain what B. had accomplished in natural philosophy *without* the aid of his method . . .; the sixth will set forth . . . the results of the application of the new method to all the phenomena of the universe.'

Doubtless, to the ordinary reader, the most interesting question in regard to B. is that which assigns to him the authorship of Shakespeare's plays, together with that of many other works of the period. The war of Shakespearians *v.* Baconians has produced much writing and not a little acrimony. For years researches have been carried on in order to clear up the so-called mystery of Shakespeare. The arguments of the Baconians may be summed up briefly as follows: Francis B. was undoubtedly, if we exclude the author of Shakespeare's plays, the greatest mind of the Elizabethan epoch. To him alone, still presuming that William Shakespeare was not the true author, can be credited the production of those marvellous plays. Countless passages in them may be paralleled in his own writings. Moreover, the sonnets, the 'key with which Shakespeare unlocked his heart,' and which open to such a shadowy portal, are peculiarly applicable to B. But it is upon negative evidence that most stress is laid. We have only five specimens of the handwriting of Shakespeare, and taking the signature, which occurs in all, we see that it is by no means clear, and certainly not what we would call an educated hand. The evidence is far from being conclusive. Certain enthusiastic supporters of the Baconian theory pin their faith to cyphers obtained by poring over the first folio of Shakespeare's plays, pub. in 1623. Perhaps the most important of these believers are Sir Edward Durning Lawrence, and Dr. Orville Owen. The latter, after thirty years' research, claims to have discovered a cypher which will lead him to the discovery of manuscripts which B. buried in the bed of the Wye. According to the cypher, he says that B. originally buried his treasure near Chepstow Castle; then later, fearing their discovery, removed them and placed them in an excavation in the mud of the Wye which he formed by diverting the course of the riv. by means of timbers. No measurements were given, but the place was indicated by means of a Rom. ford, and a reference to a cleft in the cliff. During Easter week, 1911, Dr. Owen, assisted by the Duke of Beaufort's workmen, discovered timbers which seemed to be between 200 and 350 years old, and which had not been part of a bridge. Later a type of cache was discovered, but then the work was discontinued. Dr. Owen's theory was that B. and Essex were the children of Elizabeth and Leicester, being the offspring of a marriage which took place in the Tower during Elizabeth's imprisonment there. At the age of sixteen B. discovered this, and in a fit of anger the queen admitted it. Not daring to publicly resent his position B. confided it to cypher writings, and, inspired perhaps by the story of Philip of Macedon, who buried all his treasures near a ford in the R. Oxus, B. determined to do likewise. It is conjectured that the literary secrets revealed will be even more interesting. Not only will Shakespeare's plays be proved his, but much of the work now attributed to Robert Greene, Peele, Marlowe, Spenser, etc. will be also made known as his. The stupendous nature of this claim is dismissed by

the Baconians with the assertion that even then it will not be equal in bulk to the work of Sir Walter Scott.

Setting aside all these claims, even if B. is never proved to be Shakespeare, or Shakespeare B., it is enough that his already acknowledged work be accurately judged to place him in the front rank of the geniuses of the world. In one sphere alone, if it is granted that Macaulay's words are true, he 'moved the intellects that moved the world.' Whether he did more is doubtful; let us at least pay homage to him for what he has done.

Bacon, John (1740-99), an Eng. sculptor. Trained as a modeller and painter on porcelain. In 1769 a bas-relief representing the flight of Æneas from Troy won for him the first gold medal ever awarded by the Royal Academy for sculpture. In 1770 he exhibited a figure of Mars, and in consequence received the gold medal of the Society of Arts and was elected an associate of the Royal Academy. His rivals accused him of ignorance of classic style, and to repudiate the charge he executed a head of Jupiter Tonans. The best known of his works are the monuments of Pitt in Westminster Abbey and the Guildhall, of Dr. Johnson and Howard in St. Paul's Cathedral, and of Blackstone in All Souls, Oxford. He was buried in Whitefield's Tabernacle.

Bacon, Leonard (1802-81), American Congregational minister, editor and author, called 'the Congregational Pope of New England;' born at Detroit, Michigan. Graduated at Yale University, 1820, and Andover [illegible] 1823. In 1825 First Church, [illegible]ch he was connected till his death, 1826-38. Ed. the *Christian Spectator*. He was one of the founders of the *New Englander*, 1843, and of the New York *Independent*, 1848, which he ed. in 1863. 1866-71 professor of didactic theology at Yale University, and from 1871 till 1881 of church polity and American church history. A keen advocate of temperance and of the abolition of slavery, and a writer of hymns.

Bacon, Nathaniel (1593-1660), a Puritan lawyer. Member of the Long Parliament, 1645-60. Wrote an *Historical Discourse of the Uniformity of the Government of England*.

Bacon, Nathaniel (1642-76), born in England, but emigrated to Virginia, where he became a member of the governor's council. Headed an expedition against the Indians, in defiance of Governor Berkeley's policy. Was proclaimed a rebel, captured, tried, and acquitted. B. and his supporters demanded a reduction of taxes and an extension of the suffrage. Being for a second time proclaimed rebels, they marched on Jamestown, which they captured and destroyed, but Bacon died before he could carry out any of his reforms.

Bacon, Sir Nicholas (1509-79), Eng. statesman, father of Francis B. by his second wife Anne, daughter of Sir Anthony Cooke. He graduated at Corpus Christi College, Cambridge, in 1527, after which he entered Gray's Inn and was called to the bar, 1533. In 1537 he became solicitor of the Court of Augmentations; 1546 attorney of the Court of Wards and Liveries; 1550 he became a bencher, and in 1552 treasurer of Gray's Inn. After the dissolution of the monasteries, 1539, he received a large share of the forfeited estates from Henry VIII. During Mary's reign, his Protestantism cost him many of his emoluments, though he retained his office in the Court of Wards. On the accession of Elizabeth, 1588, he became a Privy Councillor and Keeper of the Great Seal. In 1559 he was knighted and was allowed to exercise full jurisdiction of Lord Chancellor. He and his brother-in-law, Cecil (afterwards Lord Burleigh) had the ordering of eccles. matters. He had a keen political hatred for Mary, Queen of Scotland. Founded a free grammar school at Redgrave. Buried in St. Paul's Cathedral.

Bacon, Robert (*d.* 1248), the first Dominican writer in England, the brother, or, according to some authorities, uncle of Roger Bacon. He was educated at Oxford and Paris, joined the order of the Dominicans, and (possibly) succeeded Edmund Rich as treasurer of Salisbury Cathedral in 1233. He rebuked Henry III. for his fondness of foreign advisers, notably Peter des Roches. He wrote a life of Edmund Rich, *Liber in sententias Petri Lombardi, Sectiones Ordinariæ*, and other works.

Bacon, Roger (*c.* 1214-94), an early Eng. philosopher and scientist, author of numerous treatises; *b.* near Ilchester, Somerset. Educated at Oxford, where he took orders in 1233. Went to Paris for study and returned about 1250, when possibly he joined the Franciscan order. His learning won for him the title of 'Doctor Admirabilis.' His brother friars were jealous of his ability, and his research in physics and chemistry caused him to be suspected of dealings in the black arts and gave rise to doubts as to his orthodoxy.

In 1257 his lectures at Oxford were interdicted, and he was imprisoned in Paris. During his confinement he was requested to send to Rome a copy

of his work, which the Pope, Clement IV., had been forbidden to read at the time when he was Guy de Foulques, papal legate in England. B. accordingly wrote his *Opus Majus*, which he followed up in 1266 with *Opus Minus* and *Opus Tertium*. It is not known what Clement thought of them, but at any rate B.'s release was effected, and in 1268 he was back in England. Ten years later his works were again condemned as heretical, and his second imprisonment, which lasted fourteen years, was sanctioned by Pope Nicholas III. During this term of imprisonment he wrote many treatises, including *De Retardandis Senectutis Accidentibus*. He was released in 1292, and died about 1294.

B.'s fame has increased of late years. The *Opus Majus* is a storehouse of information. In it he showed up the vices of the theology of his time, expounded the necessity of reformation in the sciences by a careful study of nature, and descanted generally on alchemy and other sciences. B. discovered errors in the existing calendar, and his rectified calendar may be seen at Oxford. He had a practical knowledge of chemicals in advance of his age, but he shared in certain popular beliefs with regard to alchemy, the philosopher's stone, and the doctrine of signatures.

Bacon Beetle (*Dermestes Lardarius*), a destructive species of beetles, which attack bacon, dried foods, and stuffed collections. The insect is small and black, with the exception of the root end of the wing, which is golden-brown and dotted with three dark spots.

Bacon-Shakespeare Controversy, *see* BACON, FRANCIS.

Baconthorpe, Bacon, or Bacho, John (*d.* 1346), an Eng. schoolman and philosopher, called the 'Resolute Doctor;' the grandnephew of Roger B. He entered a Carmelite monastery near Walsingham, graduated at the university of Paris; became the head of his order in England, 1329-33. In 1333 he went to Rome, and returned to England in 1346. He preached the doctrines of the Arabian philosopher Averrhoes (*q.v.*), and wrote commentaries on the Bible and numerous treatises, including *Commentaria super Quatuor Libros Sententiorum*, Paris, 1484. Consult Aymers (Turin, 1667-9, and Zagalia (Ferrara and Parma, 1696-1706).

Bacs, or Bacs-Bodrogh, a co. of Southern Hungary, being a plain lying between the Danube and Theiss, which rivs. are joined by the Bács or Franzens Canal, constructed between the years 1796 and 1802. Area 4309 sq. m. The soil produces the best wheat in Hungary. The vine, fruit, hemp, and tobacco are also cultivated. Cap. Zombor. Pop. (1900) 767,632.

Bacsanyi, Janos (1763-1845), Hungarian poet. His first pub. work was *The Valour of the Magyars*, a poem. He edited the *Magyar Museum*, which was suppressed by the gov. as advocating dangerous liberalism. He was complicated in the conspiracy of Bishop Martinovitch, and suffered imprisonment. During the remainder of his life he suffered persecution.

Bacteria, minute vegetable organisms possessing no chlorophyll, and multiplying under favourable conditions by repeated bi-partition. The names bacilli, microbes, micrococci, micro-organisms, and germs are also popularly applied to the group as a whole, but in scientific classification they are called schizomycetes. The organisms are so small that 1500 of some species placed end to end would hardly extend across the head of a pin, and multiply so rapidly that a single microbe might produce sixteen and a half million in twenty-four hours. Their general function is the breaking up of organic matter, causing changes in its chemical constitution which may be beneficial, as in preparing nutriment for vegetation in the soil; or harmful, as in the causation of disease in man, animals, and plants.

Structure.—Bacteria are unicellular plants of varying shapes: spherical, ovoid, cylindrical, or spiral. The cell consists of a mass of protoplasm with irregular spaces, and is enclosed by a cell wall which appears to be a modification of the protoplasm, but is usually not cellulose. No nucleus has been discovered in the cell, but there are often fat-like granules which take a deep stain. Grains of starch, droplets of oil and fat, particles of sulphur, and traces of pigment are sometimes observed. Most B. have a power of locomotion derived from the development of *cilia* or *flagella*, fine threads of protoplasmic material which project probably through pores in the cell wall. The cilia are difficult to see under the microscope even when stained, but in many cases have been photographed.

Reproduction.—When conditions are favourable, a constriction appears in the middle of the cell, in a direction at right angles to the long axis. A partition wall is formed and the microbe divides into two. When the conditions are unfavourable to the life of the B., a small mass may collect at one end of the cell surrounded by a dense membrane. This mass is called a spore, and may survive adverse conditions which would kill the microbe. The vital force remains

dormant until the spore is placed in favourable circumstances again, when it expands into the complete bacterium and goes on with its life work.

Classification.—The subdivision of schizomycetes is still in a provisional and tentative state. Attempts have been made to base a method of classification on
tribution
elementar
similarity
cocci are small spheroidal B.; when joined together in a chain they are termed *Streptococci*, and others that grow in masses or bunches are called *Staphylococci*. Rod-like or cylindrical B. are called *Bacilli*, and those occurrin
where
B.
nfusion
of different forms, spherical, cylindrical, and spiral. Some species use up all the available nourishment and die or dwindle into spores. Other species enter and multiply, and are in their turn destroyed through the exhaustion of the food supply or by the poisons created in the medium by other species.
is thus alway
difficult to stu
actions unless each species can be separately collected. This may be done by placing upon a sterilised slice of potato or other suitable medium a small quantity of bacteria-containing material, and the whole kept in a tube at a temperature favourable to the growth of the B. When masses or colonies of B. appear, if it is required to separate the species the medium is diluted with melted gelatine or agar-agar so that the B. are well scattered. The gelatine mixture is then poured into a Petri dish, a shallow glass vessel with a glass cover. The gelatine solidifies, so that the B. are fixed in the medium. Around each bacterium a colony grows up, which is prevented from admixture with other species by the solid nature of the medium. Little bits of gelatine containing the desired colonies may be picked out with a sterilised platinum needle and transferred to separate tubes. In this way what is called a 'pure culture' may be obtained. B. are best examined under the microscope by staining the mixture with analine dyes in solution, such dye being used as is known to colour the B. and leave the medium comparatively unaffected. When a pure culture has been obtained, experiments are performed with the view to determining how they are affected by changes in their environment, the application of heat and cold, the addition of various drugs, etc. Such researches have often led to the adoption of successful remedial measures in the case of dangerous disease-germs. Inoculating animals has been the means of producing interesting information, but as a rule the difference in the blood composition of certain animals as compared with man renders much of the evidence obtained inconclusive.

Putrefaction.—When life has departed from any organic substance, B. are quickly on the spot to feed upon the dead matter, changing the composition of the substance, absorbing what they need for their own nourishment, and setting free the remainder. The rejected substances are very often bad-smelling gases, but sometimes aromatic vapours. Whether obnoxious to man or not, they are utilised by some plant or animal which depends upon the services of the B. for its nourishment. The farmer avails himself of the changes produced by B. in preparing his manure heaps, and the organisms may be said to be the medium by which the dead organic matter is converted into substances capable of being once more assimilated by living matter.

Phosphorescence. — The greenish light which is sometimes observed on the surface of the sea or on the bodies of salt-water fish is due to the presence of a bacterium which flourishes in the presence of sodium chloride and free oxygen. The phosphorescence exhibited by meat, decaying wood, and vegetables is also due to a microbe. The way in which the phosphorescence is produced is at present a mystery.

Bacteria and nitrogen.—Among the most important phenomena associated with bacterial action is the way in which the nitrogen of the atmosphere is rendered available for the use of animals and plants. Plants require carbon, oxygen, hydrogen, and nitrogen for their growth. All these exist in the atmosphere, but atmospheric nitrogen cannot be used by plants until it has first been converted into nitrates by the agency of bacteria. Leguminous plants, such as clover, peas, beans, etc., are so well served in this respect by particular B. that they actually leave the soil richer in nitrogen than when they were sown. The microbe lodges in the root as a parasite, and its presence is indicated by the appearance of nodules or tubercles upon the roots. Plants which are affected by this bacterium grow more vigorously than plants grown in sterilised soil and free from nodules. Leguminous plants are therefore an important item in the rotation of crops, and artificial cultures of the B. concerned are prepared so that the plants may attain

their highest efficiency in attracting nitrogen to the soil.

Bacteria and heat.—B. are killed by extreme heat, and boiling is usually relied upon for the sterilisation of milk, etc. There are certain organisms called *thermophilous* or 'heat-loving' B., which grow and multiply at 70° C. Such germs are responsible for the heating of damp hay and other vegetable products. Other forms are found flourishing in hot springs at a temperature of 77° C.

Bacteria and cold.—Some B. resist the action of cold, and cannot only move actively in cold water, but may be frozen fast in blocks of ice. In this state the B. do not multiply, but remain in a dormant condition until a more favourable environment is estab. Experiments with liquid air and liquid hydrogen have shown that some B. survive the lowest temps. that have yet been obtained. It is a mistake to suppose, therefore, that ice is necessarily aseptic. Nevertheless the fact that the growth and multiplication of B. are arrested by low temps. renders the use of ice in preserving foodstuffs of great importance.

Bacteria and light.—As a rule, B. are destroyed in a short time by bright sunlight, and in any case develop more rapidly in the total absence of light. It has been found that the ultra-violet rays are most efficient in bactericidal action, and the electric arc, which is particularly rich in blue-violet and ultra-violet rays, has been used with some success in the treatment of lupus by the Finsen lamp. There have been attempts at utilising these rays in the sterilising of milk and for other purposes, but a really efficient and economical apparatus has yet to be found. One desirable point in such a process is that the dreaded bacillus of anthrax is destroyed, whilst it survives the temp. of boiling in the ordinary processes of sterilisation.

Bacteria and disease.—The connection of B. with certain forms of disease was conclusively demonstrated by Pasteur, though it had long been suspected that suppuration was due to the presence of organisms in wounds. Diseases due to wounds are caused by small spherical B., *streptococcus pyogenes* and *staphylococcus pyogenes*. They are constantly present where people are gathered together, especially in sick wards of hospitals and other places where there are persons affected with suppurative inflammation. Child-bed fever is caused by the same organisms, and undoubtedly many cases were occasioned by doctors and nurses carrying infection before the origin of the disease was known. The danger has been considerably lessened by the precautions taken to sterilise the hands and instruments used in childbirth and by the gradual improvement in the standard of efficiency and general intelligence of midwives.

The formation of pus when wounds are infected by these B. is due to the action of the *leucocytes*, or white corpuscles of the blood. They are single cells which under ordinary circumstances circulate with the blood-stream, but are capable of penetrating the walls of the blood-vessels into spaces in the tissues. The work they do is the engulfing and digesting of small particles of waste or foreign substances, and they thus serve as scavengers to the blood. When B. enter a wound the corpuscles make their way to the part affected, and there ensues a struggle between the absorbing powers of the leucocytes and the multiplying power of the B. The dead bacteria and corpuscles form a white or creamy mass known as pus, and this is discharged from the wound. If the corpuscles are successful in the struggle, they help, with the co-operation of other cells in the blood, in forming new tissue to heal the wound. If the B. are not destroyed they may penetrate to other parts of the body, where other abscesses and growths may be formed. The great danger to health lies in the changes in the composition of the blood due to the action of the blood; toxins or poisons are formed and circulate in the blood, forming the condition known as *toxæmia*; if the B. themselves with their toxins are carried away in the blood-stream the condition is called *septicæmia*.

Tuberculosis.—The disease known as consumption or tuberculosis is occasioned by very small rod-shaped bacilli, which gain access to the body and form round themselves little masses of new tissue, called tubercles. These are often formed in the lungs, and when the tubercles break down owing to the dissemination of the bacterial poison, cavities are produced which naturally impair the efficiency of the lung and serve as a depôt for the bacilli. The bacilli of tuberculosis only exist in the bodies of human beings and certain animals, so that it is possible, by destroying the bacilli at every opportunity, to eradicate the organisms altogether. When ejected from the living body in the sputum they retain their vitality for some time, and it is by this means that infection of other persons often takes place. The resistance of the human body to the tubercle bacillus is, however, considerable, and the maintenance of general health is

of prime importance in persons threatened with consumption.

Typhoid fever is caused by rod-like *bacilli* which are considerably larger than those associated with tuberculosis. They enter the body with food or drink and multiply in the intestines, giving rise to toxins which when carried to other parts of the body produce the characteristic symptoms of the disease. The bacillus

typhoid is bound up with the methods of sewage disposal. A unique feature is that the *bacilli* sometimes become domesticated in the person who has recovered from the disease, and although no longer injurious to their host, are still capable of infecting other persons.

Pneumonia is incited by lance-shaped [illegible] which [illegible] and mouth. They are delicate organisms, and only thrive when the resistance of the body is considerably diminished. Over-work and bad conditions of life are more responsible for the development of the disease than the mere presence of the pneumococci, and a plentiful supply of oxygen for the body-cells is an important factor in the overcoming of the toxins produced by the bacilli.

Other pathogenic bacteria.—Tetanus *bacilli* are club-shaped organisms which flourish in ordinary cultivated soil and street dust. In the human [illegible] jaw which gives the name of 'lock-jaw' to the disease. Infection is usually caused through dirty wounds. The plague bacillus is a short and plump organism which has a partiality for the rat as well as for man, and it is possible that the disease may be communicated from the rat to man by means of fleas which have themselves become infected. The B. of many diseases have not yet been isolated: that of yellow fever is undoubtedly associated with a particular species of mosquito, but the parasite itself is still an enigma.

Immunity.—Individuals and races vary in their susceptibility to bacterial disease, owing probably to some inherited constituents in the blood which renders it favourable or other- [illegible] B. Where unaffected are said to enjoy natural or hereditary immunity. It is also possible to *acquire* immunity from a second attack of a disease by the changes induced in the body as a consequence of the first attack. When bacterial poisons are produced in the blood, the body-cells elaborate certain substances which unite with these toxins and render them harmless. A habit of forming such anti-toxins may be estab. with the result that on subsequent infection the body may already be in a condition to neutralise the effects of bacterial invasion. Thus people who recover from small-pox, measles, scarlet fever, and, to a certain extent, typhoid fever, are protected from further attacks for a considerable time. The anti-toxin is usually specific, that is, it is only effective against one particular disease, and considerable progress has been made in the artificial preparation of anti-toxins to aid the natural resisting power of the body in fighting certain diseases. For example, when a horse is inoculated with the poison produced by diphtheria bacilli, his cells are stimulated to bring forth the appropriate anti-toxin. The treatment is continued with larger doses of the toxin as the horse increases his resisting pow [illegible] toxin. He is [illegible] or clear fluid and used t. patients, thus enabling them to combat the disease with greater prospects of success.

It is also found that by introducing into the blood certain killed B. or 'vaccines' the body-cells are stimulated to produce substances called *opsonins*, which cause the B. to become easier prey for the defending corpuscles of the blood. Treatment of this nature, therefore, tends to make the body immune against the particular disease. *See* W. D. Frost and E. F. M'Campbell, *Text-book of General Bacteriology*, 1910; R. T. Hewlett, *Manual of Bacteriology*, 3rd ed., 1908; R. Muir and J. Ritchie, *Manual of Bacteriology*, 5th ed. 1910.

Bacteroids, a name applied to the bacteria which form tubercles on the roots of leguminous plants, *e.g.* beans living in symbiotic relationship with the plant.

Bactria, part of anct. Persia, corresponding to modern Balkh in Afghanistan, bounded on the N. by Sogdiana, on the S. by Ariana. Its early history is mythological. Conquered by Cyrus *c.* 540 B.C., when it was made one of the satrapies of the Persian empire. It was conquered by Alexander, and became a prov. of the Macedonian empire under the rule of Seleucus. About 255 B.C. Diodotus, a satrap, asserted his independence and founded a Greco-Bactrian kingdom which extended as

far as the Kabul and the Indus. During the 6th century A.D. it was subjugated by the Turks and came under the rule of Islam. The cap., Bactra, or Zariaspa (modern Balkh), was the cradle of the Zoroastrian religion.

Bactrian Coins have been found in the 'topes' or burial-places to the N.E. of Kabul. The inscriptions are written in the B. alphabet, an offshoot of the Iranian alphabet. The same characters are found on rocks near Peshawar and Kathiawar, which had been inscribed in the 3rd century by Asoka, a great Buddhist emperor, with sermons on his faith. Dr. Isaac Taylor discovered that the numerals in ordinary use are the actual symbols of Indo-Bactrian letters found on the above-mentioned coins, *e.g.* 4 is the Indo-Bactrian letter ch, chatur (*cp.* Lat. *quatuor*), 5 is *p*, panchan (*cp.* Gk. πεντε). This alphabet was probably introduced into India after the conquest of Darius, then brought to Spain by the Arabs in the 12th century, whence it spread throughout Europe, and was adopted in place of the more clumsy Roman figures.

Bactris (Gk. βάκτρον, staff), a genus of American palms of small size, with slender stems which are much used in making light but solid walking-sticks. *B. maraja* produces a small fruit of pleasant taste; *B. acanthocarpa*, a fibre used in making nets.

Bactrites, a genus of fossil ammonitidæ with a straight instead of a spiral shell. The genus is found in Silurian and Devonian strata.

Baculites, a genus of polythalamous cephalopods belonging to the family of fossil Ammonites. The shell is elongated, straight, and conical. The chambers are pierced by a marginal siphon. B. are found in neocomian and cretaceous formations. The best specimens are to be found in the bacul te limestone of Normandy.

Bacup, a modern municipal bor. and mrkt. tn. of the Rossendale div. of E. Lancashire, England, on the Lancashire and Yorkshire Railway. Cotton spinning and power-loom weaving are the chief industries. There are also dye-works, brass and iron foundries, coal-mines and stone quarries in the dist. The pop. is 34,178 (1901).

Badagry, a small state and tn. in Southern Nigeria, Africa. It does a considerable trade in palm-oil.

Badajoz, a frontier prov. of Western Spain, formed in 1833 from dists. taken from the prov. of Estremadura. Pop. (1900) 520,246; area 8451 sq. m. The country is watered by the R. Guadiana, and there are low ranges of hills. The climate varies between extremes of heat and cold. The rainfall is scanty. The prov. suffers through lack of water and means of communication. The Madrid-Lisbon Railway passes through Villanueva de la Serena, Mérida, and Badajoz. Agriculture is neglected, but live-stock—acorn-fed swine, sheep, and goats—is reared. Lead and copper are found in small quantities. The important tns. are: B., the cap., 30,899; Almendralejo, 12,587; Don Benito, 16,565; Azuaga, 14,192; Villanueva de la Serena, 13,489; Mérida, 11,168.

Badajoz, the cap. of the Spanish prov. of the same name, situated on the l. b. of the Guadiana. The tn. is a natural fortress, built on a slight hill which is crowned with the ruins of a Moorish castle. It is the Pax Augusta of the Romans. Later captured by the Moors, and in 1031 made the cap. of a small Moorish kingdom, when it was named Bax Augos, or Bathaljus. In 1168 held by the Portuguese, but retained its independence till 1229, when it was captured by Alphonso IX. As a key to Portugal it has been an important stronghold in times of war; 1660 besieged by the Portuguese; 1705 besieged by the allies in the War of the Spanish Succession. During the Peninsular War it was unsuccessfully attacked by the Fr. in 1808 and 1809, and finally surrendered to Marshal Soult, 1811. It was a scene of terrible slaughter when Wellington pillaged the city, 1812. The prin. industries are woollens, cotton, leather, pottery, soap, and there is a large trade in cattle. Pop. (1900) 30,899.

Badakhshan, a dist. in Central Asia, bounded on the S. by the Hindu Kush Mts., and by the Amu Darya on the N. There are beautiful woods, fertile valleys, and much pasture land. Travellers speak with the highest praise of its orchards and flower-gardens, its fruit and nightingales. It was visited by Marco Polo, 1272-3, and by General Wood, 1837-8. The inhab. are Tajiks, an Aryan race, speaking Persian. They are Mohammedans. Cap. Faizabad. Iron, lapis-lazuli, and rubies are found. Many kinds of animals are to be found there, of which may be mentioned the yak, cattle, camels, wild sheep, wolves, foxes, jackals, bears, boars, and leopards. Originally belonged to the Gk. Bactria. From the 13th century onwards governed by the so-called descendants of Alexander the Great. In the 18th century it belonged to the empire of Nadir Shah. In the 19th it was captured by the chiefs of the Kataghan Usbegs of Kunduz, but in 1859, Mir Jahanded Shah, a representative of the present dynasty, was reinstated and agreed to pay tribute to Afghanistan. In 1873 England and

Russia agreed upon a frontier between Bada hshan and Afghanistan. Pop. about 100,000.

Badalocchi, Sisto (*c.*1581-*c.*1650), surnamed Rosa, *b.* at Parma. An Italian painter and engraver, pupil of Annibale Carracci, whom he and a co-disciple, Lanfranco, accompanied to Rome in 1606. There he executed two paintings for Verospi Palazzo, both representing Polyphemus and Galatea, and he assisted his master in some of his prin. works. On the death of Carracci, 1609, he went to Bologna, where he died about 1650.

Badalona, a seaport in the prov. of Barcelona, Spain, 5 m. N. of Barcelona town. The surrounding dist. is rich in fruit. The tn. has ship-building, sugar-refineries, and glass-works.

Baden, The Grand Duchy of, part of the German empire, lies between Alsace-Lorraine and Würtemberg, and is separated from Switzerland by the Rhine. It is divided into four dists., Constance, Freiburg, Karlsruhe, and Mannheim. The country is mountainous. The Schwarzwald, or Black Forest, has a maximum alt. of 4903 ft. The Neckar highlands are lower; to the N. of them begins the Odenwald. To the S. are the wide plateaus of the Ger. Jura, drained by the Rhine and the Danube. The tribs. of the Rhine on the B. side are the Neckar, Murz, and Elz. The north-eastern territories are bounded by the Maine. There is one lake, Constance. The Rhine valley is very warm, and the soil rich and fertile. Vegetables of all kinds, grain, hemp, tobacco, opium, and wines are produced. Cattle are reared, and the production of honey is important. Clocks and straw-plaiting are the chief industries, and the jewellery of Pforzheim is well known. Other manufs. are ribbons, cottons, brushes, paper, cigars, leather, rubber goods, machinery, mirrors, and chemicals. Limestone quarries are worked, and there are important clay and gravel pits. Coal-mines ... are foun

... There is a ... house and a chamber of sixty-three representatives. B. sends three representatives to the Bundesrath and fourteen to the Reichstag. School teaching is excellent. There is a Protestant university at Heidelberg and a Roman Catholic one at Freiburg. The early inhab. were Alemanni, who fell under the dominion of the Franks; 496 conquered by Clovis and christianised; 748 Pepin the Little abolished the dukedom of Alemanni. In the 11th century Duke Berthold built the castle of Lähringen in Breisgau and started the house of Lähringen. His second son Hermann took the title of margrave, and became the ancestor of the still famous house of B. In 1715 Margrave Charles William built Karlsruhe. His grandson, Charles Frederick, succeeded in 1746; he favoured the policy of Napoleon, joined the confederation of the Rhine, and in consequence doubled his estates, and gained the title of elector and grand-duke. In 1811 he was succeeded by his grandson, Louis Frederick, who seceded from the confederation of the Rhine and in 1815 joined the Ger. confederation. In 1830 Leopold succeeded his half-brother Ludwig, and his rule began with a contest between Liberals and reactionists. In 1846 the constitutionalist Bekk was made Minister of the Interior and Liberalism had the upper hand. In 1848, at the time of the Revolution in France, Hecker and Struve drove out the grand duke and estab. a republic. The latter was reinstated by the Prussians, July 1849. In 1866 B. joined Austria against Prussia, and, when peace was made in the following year, joined the N. Ger. confederation. 1870-1 fought in the Franco-German War and became part of the restored German empire. Pop. (1908) 2,009,320.

Baden, or Oberbaden, a watering-place in the Swiss canton of Aargau, on the l. b. of the Limmat. Famous for its sulphur baths (the Aquæ Helvetiæ of the Romans), which reach a temperature of 117° F. From the 15th to the 18th century it was the seat of the Swiss diet. Pop. (1900) 6050, but visited yearly by 20,000 persons.

Baden-Baden, in the valley of the Oos, at the edge of the Black Forest, 8 m. from the Rhine. A famous resort of society people of all nationalities. The season lasts from May to Sept., and there is a brief winter season. The gaming-tables were once famous, but were abolished in 1872. There are medicinal springs composed of iron, magnesia, lime, and sulphur, and varying in temperature from 115° to 150° F. On the summit of the Schlossberg are the ruins of an old castle, destroyed by the Fr. in 1689. The 'new castle,' built 1479 and likewise destroyed in 1689, has been restored, and is the summer residence of the grand duke.

The city was founded in the 2nd century A.D. by Hadrian (*Civitas Aurelia Aquensis*). Rom. antiquities and the remains of a vapour bath and dungeons have been found. Pop. (1905) 16,238.

Baden-bei-Wien (Baden near Vienna), a fashionable resort of Lower Austria, in the valley of the Wienerwald, 16½ m. by rail from Vienna.

Known to the Romans as Aquæ Pannonicæ. Famous for sulphur springs, which are visited annually by over 10,000 persons. These springs vary in temperature from 79° to 104° F., and are recommended for gout, rheumatism, and all kinds of skin diseases. Pop. (1900) 12,447.

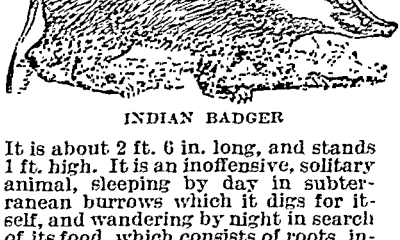
Badenoch, a dist. in the S.E. of Inverness-shire, Scotland, 45 m. in length and 19 m. in breadth. It is traversed by the Spey. Gneiss rock and granite are found.

Baden-Powell, Lt.-Gen. Sir Robert Stephenson Smyth, K.C.B., C.V.O. (*b. 1857*), *a British officer, son of* the Rev. Professor Baden-Powell of Oxford. He was educated at Charterhouse, and joined the 13th Hussars in 1876, with which he served in India, Afghanistan, and S. Africa. Assistant military secretary in S. Africa, 1887-9, in Malta, 1890-3; commander of the native levies in Ashanti, 1895; served with distinction in the Matabele campaign, 1896-7; ra[illegible] of the 5th Dragoo[illegible] the Boer War he [illegible] by his brilliant defence of Mafeking; in spite of famine and sickness, with a force of 1200 men he held the tn. for 215 days, till its relief on May 18, 1900. In recognition of his ability he was raised to the rank of major-general; inspector-general of the S. African constabulary, 1900; inspector-general of the cavalry, 1903-7. With the object of promoting a spirit of patriotism among the rising generations, he started the Boy Scouts movement, 1908, in which organisation he is Chief-Scout. He was knighted in 1909. [illegible] Acade[illegible] tions [illegible] 1889; [illegible] *struction*, 1895; *The Matabele Campaign*, 1896; *Sport in War*, 1900; *Scouting for Boys*, 1908.

Badenweiler, a vil. of Baden, Germany, noted for its alkaline thermal springs. It is near the Black Forest, and 3 m. from Mülheim. It contains remains of Roman springs. Pop. 600.

Badge, a device used as a distinctive emblem of families, countries, etc. It is a simpler and more primitive cognisance than the crest or coat-of-arms, and is not subject to the laws of heraldry. Bs., like crests and coats-of-arms, are usually symbolical in character, but on the one hand are distinct from the coat-of-arms as not being supported on a shield, and on the other hand are distinct from the crest as not surmounting a wreath. Famous badges are the *fleur-de-lis* of the Fr. kings, which can be traced back to the reign of Louis VII. (1137-80), the Tudor rose, the thistle of Scotland, the harp and trefoil of Ireland, and the cross of Christianity. Bs. are also worn as signs of office, or as a token of membership of some society, *e.g.* Solomon's seal and the mason's tools used as an emblem by Freemasons, and the primrose used as a badge by members of the Primrose League. Bs. are used by savage peoples to identify their arms and mark their belongings. From the B. the more elaborate devices of heraldry were evolved.

Badger (*Meles*), a genus of burrowing carnivores, constituting with the skunks the sub-family Melinæ in the Mustelidæ, or weasel and otter family. Its chief characteristics are short, strong legs, long and more or less plantigrade feet, and a pointed muzzle. [illegible] glands, containing a fetid odour [illegible] be of use in sex-attraction. The common B. (*M. taxus* or *M. vulgaris*) is found in the hilly and woody dists. of Europe and Asia, but is now rare in Great Britain. Its colour is greyish-brown, with a white head marked with black lines running from the nose to the back of the ear.



INDIAN BADGER

It is about 2 ft. 6 in. long, and stands 1 ft. high. It is an inoffensive, solitary animal, sleeping by day in subterranean burrows which it digs for itself, and wandering by night in search of its food, which consists of roots, insects, frogs, and the larvæ of wasps and bees. The American B. (*Taxidea Americana*) is more carnivorous, and eats small animals such as marmots. Bs. are conspicuous for their shrewdness, perseverance, and courage. The cruel practice of badger-baiting, or drawing the B., was prohibited in England in 1850. A B. was kept in a barrel and attacked by dogs until it at last gave way and was dragged out. Then its owner released it from the dogs and put it back into the barrel to recover itself. This performance was continued during the day, and formed an attraction at public-houses of a low order. The verb 'to badger,' meaning to assail repeatedly, to worry, is probably derived from this practice.

Badger, George Percy (1815-88), an Arabic scholar, born at Chelmsford,

Essex. His early life was spent at Malta and Beirut. He worked in the editorial dept. of the Church Missionary Society at Malta, and in 1841 entered that Society's institution at Islington and became a priest. On account of his knowledge of the eastern languages, he was sent out as delegate to the eastern churches (1842-4 and 1850); gov. chaplain at Bombay, 1845; chaplain at Aden, 1846. He joined a Persian expedition under Sir James Outram, 1854-7. He was created D.C.L. by the archbishop of Canterbury in 1873. Author of *The Nestorians and their Rituals*, 2 vols., 1852; *An English Arabic Lexicon*, 1881.

Badger-baiting, *see* BADGER.

Badghiz (home of the winds), a dist. in the N.W. of Afghanistan, and bounded by the Murghab and Harirud rivs. The region of the Murghab R. is fertile.

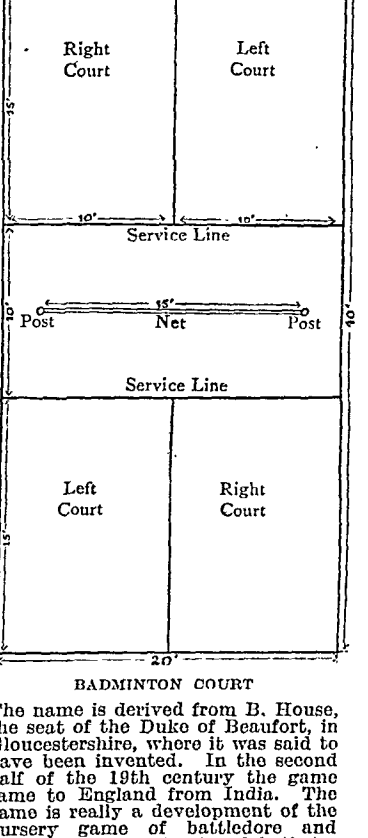
Badia-y-Lablick, Domingo (1766-1818), a Spanish traveller, *b.* at Barcelona. He had enthusiastically studied Arabic language and life, and to complete his education he disguised himself as a Mussulman and called himself Ali-Bei. His disguise was perfect, and he was invited to the court of the Sultan of Morocco, where he was held in high esteem. Two years later he went on a pilgrimage to Mecca, and there performed all the rites. He returned to Spain, but he was forced to quit the country on the fall of Napoleon. At Paris he pub. an account of his adventures in the E., under the title of *Voyage d'Ali-Bei en Afrique et en Asie*, which soon became popular all over Europe. During his last voyage to the E. he died.

Badister (Gk. *βαδιστής*, walker), a genus of coleopterous insects belonging to the family Carabidæ. They inhabit marshy dists. of India and Madagascar; they are of small size and of a reddish, yellow, or black colour.

Badius Jodocus, or Josse (1462-1535), an eminent Fr. printer. He was born at Assche, near Brussels, and is therefore sometimes called Ascensius. He studied at Ghent, Brussels, and Ferrara, and taught Gk. at Lyons and Paris. Treschel, a famous printer, engaged him as corrector of his press, and afterwards secured his services as a partner in the business. In 1500 he settled in Paris and estab. a printing office that went by the name of Prælum Ascensianum. He also wrote books, which include *A Life of Thomas à Kempis*, *Satire against Erasmus's contra v* [illegible] *rum*, a [illegible].

Bad Lands, great stretches of waste and rugged country in the W. of the United States. Such regions are found in S. Dakota and Nebraska, on the White R., the Yellowstone, and the Little Missouri. Their chief interest is zoological, as they contain valuable fossil specimens.

Badminton is a game which only attained to popularity in this country because its introduction was a few years prior to the introduction of the more interesting game of tennis. Before the game was introduced into England it was much played in India.



BADMINTON COURT

The name is derived from B. House, the seat of the Duke of Beaufort, in Gloucestershire, where it was said to have been invented. In the second half of the 19th century the game came to England from India. The game is really a development of the nursery game of battledore and shuttle-cock, and is played both indoors and out-of-doors. B. is not unlike tennis in character, but is played with shuttle-cocks instead of balls, and the play consists entirely of volleying. The game is played on courts with one player on each side of

the net (the two-handed or single game), or with two players on each side of the net (the four-handed or double game). The shuttle-cock should have sixteen feathers about 2½ in. long fixed in a cork 1 in. in diameter, and should weigh from 75 to 85 grains. The diameter of the circle formed by the feather tips should be about 2½ in. The racket is much slighter than the type used in tennis, though not of specified shape or dimensions, but it usually weighs 6 ounces. The net should be 5 ft. high at the centre and about 5 ft. 1 in. high at the posts. The net varies from 17 to 24 ft. in length according to the position of the posts. Choice of courts or service is decided by a toss. If the winner of the toss chooses first service the loser chooses ends and *vice versâ*. The game consists of fifteen aces. At 'thirteen all' the side first reaching thirteen has the option of setting five (a long game), and when the score is 'fourteen all' of setting three. The court varies from 30 to 40 ft. in length, and from 15 to 20 ft. in breadth. The maximum court is divided into four courts measuring 15 ft. by 10 ft., thus leaving a centre space of 10 ft. by 20 for the net. The arrangement of the courts is thus similar to the arrangement in tennis, only the server serves from within the courts. The server hits the shuttle-cock into the diagonally opposite court, and the opponent returns it with a volley. The volleying continues until one of the players misses the shuttle-cock or makes a fault. A fault consists in breaking one of the following rules: 1. The server must stand with both feet in the court. 2. The shuttle-cock must clear the net without coming into contact with it or the posts. 3. The shuttle-cock must drop into the court diagonally opposite. 4. The player must not hit the shuttle-cock twice. 5. The shuttle-cock must not be pushed over the net by a part of the body. In serving, as in tennis, two consecutive faults put the server out, but should the opponent take a fault the stroke is no longer regarded as a fault. Sides are changed at the beginning of the second game and at the third game if it is played. During the third game the sides change ends when the side which is leading reaches eight in a game of fifteen aces, or six in a game of eleven aces. The great defect in the game of B. when played out of doors is, that the shuttle-cock is very apt to be caught in the wind. To obviate this difficulty a lead weight is often inserted in the shuttle-cock, but this device is really only of use when the wind is not very high. When the wind is strong B. played out of doors ceases to be a game of skill and degenerates into a mere game of chance. Other methods have been adopted. Frequently the net is arranged so that the wind strikes it obliquely, and thus both sides are equally handicapped. When the direction of the net cannot be altered, compensation can be made by moving the net a foot or so in the direction of the wind. Thus the player who stands against the wind has not to cover as great a distance as the player who has the wind in his favour. B. on the whole is more successful as an indoor game. A room of smaller dimensions than the regulation court often renders the game exciting. When the shuttle-cock strikes the walls in such a room it will bound off and allow the player to hit it before it touches the ground. B. can be played with artificial light, but the courts should be lit from above as in a billiard-room. B. suffered owing to the popularity of tennis for many years, but lately it is being more favourably received.

Badminton, or Great Badminton, a village of Gloucestershire, England, about 100 m. distant from London. Here is the seat of the Duke of Beaufort, B. House. It is an imposing mansion in the Palladian style of architecture, surrounded by fine grounds. B. House has given a name to the game out of which tennis was evolved, to a kind of claret cup, and to the Badminton Library.

Badminton Club, a London sporting club which was founded in 1876 and named after the estate of the Duke of Beaufort. It is located in 100, Piccadilly, has 1000 members united in the interests of coaching and sporting; the entrance fee is 20 guineas, and the annual subscription is 8 guineas.

Badminton Library, a standard library of sport and pastimes embracing 26 subjects in 29 vols., which was projected by a member of Longmans' firm and ed. by the eighth Duke of Beaufort and A. E. T. Watson between the years 1885 and 1902.

Badnera, a tn. of Berar, British India, in the dist. of Amraoti. It contains a cotton factory, and is situated on the Great Indian Peninsular Railway. Pop. 11,000.

Badoc, a tn. of Luzon, Philippine Is., in the prov. of Ilocos Norte and about 20 m. S.W. of Laong. Pop. 11,000.

Badrinath, a peak in the Himalayas 23,210 ft. above sea-level. On one of its slopes stands the temple of Shrinagar, whose thermal springs, supposed to be endowed with the power of cleansing away sin, are frequented by thousands of pilgrims.

Baduria, a tn. of Bengal in the

prov. of Calcutta, British India, on the Jamuna riv., a branch of the delta of the Ganges. It has a considerable trade in molasses and sugar. Pop. 13,000.

Bæda, a variation in the spelling of the name of the Venerable Bede.

Baedeker, Karl (1801-59), a Ger. pub- [illegible] born at Essen, [illegible] ied on business as a bookseller. He started a book shop at Coblenz in 1827, where he died. His fame chiefly remains on account of his excellent guides. The first guide he published was a handbook on the Rhine. B. guides are now considered the most reliable series in the market. These were based on Murray's *Handbooks*, and are now said to surpass all other guide-books. They have been translated into [illegible] lish editions [illegible] business was [illegible] 1872, where being prepared.

Bael, or **Bhel** (*Ægle marmelos*), an Indian tree prized for its fruit, which is of the orange order. The ripe fruit is very agreeable, and the unripe fruit is dried and used as an astringent. Yellow dye is derived from the rind.

Baena, a tn. in the prov. of Cordova, Spain, about 30 m. S.E. of Cordova. Near B. is the castle which belonged to Gonzalo de Cordova, the famous captain.

Baer, Karl Ernst Von (1792-1876), Ger. zoologist, *b.* at Piep in Esthonia. His studies and researches in embryology resulted in his discovery of the human ovum on which he wrote a treatise *Epistola de Ovum Mammalium et Hominis Genesi*. His next great work was his 'History of the Evolution of Animals' (*Ueber die Entwickelungsgeschichte der Thiere*). This book explodes the animalculist theory and proves that the Graafian follicles in the ovary are not eggs, but the real ovum is the spherical vesicle contained by them. He then carefully traced the development of the fertilised egg and the order of the appearance of the organs of the body. Baer was appointed librarian of the Academy of Sciences at St. Petersburg in 1834. The remainder of his life was spent in indefatigable research both in zoology and biology. He made exhaustive studies of the fish of the Baltic and Caspian Seas. Towards the end of his life he pub. his famous autobiography. The work of B. greatly influenced Huxley and Spencer, and he is regarded as the founder of comparative embryology.

Bætica, one of the three provs. into which Augustus divided Hispania, the Spanish Peninsula. The other two were Tarraconensis and Lusitania. B., called after the river Bætis (=Guadalquivir), was separated from Lusitania by the R. Anas (=Guadiana), and from Tarraconensis by an imaginary line drawn from the Anas to the promontary Charidemus in the Mediterranean. B. was made into a Rom. colony, with Corduba as its seat of government. The Romans praised the climate and the fruit. The early trade of the country was chiefly in horses, asses, sheep, and wool.

Bætis, the Roman name of the modern Guadalquivir, a river in S. Spain.

Baeyer, Johann Friedrich Wilhelm Adolph Von, a German chemist, *b.* at Berlin, 1835. Studied chemistry and physics under Bunsen and Kekulé; professor of chemistry at Strassburg (1872). Since 1875 he has lectured at the University of Munich. He was awarded the Davy Medal by the Royal Society in 1881, and the Nobel prize in 1905. He is the leading authority on the chemistry of indigo and has made valuable contributions to the knowledge of theoretical chemistry.

Baeza, an old-world tn. in the prov. of Jaen, Southern Spain, 9 m. from a station of its own name which is 160 m. S. of Madrid. It is the Beatia of the Romans and was once a flourishing Moorish city. There is a cathedral and the remains of the university (1533). The city was sacked by the Castilians, 1228. Pop. (1900) 14,379.

Baffa, *see* BAFFO.

Baffin, William (1584-1622), an Eng. explorer and navigator. Accompanied James Hall on a voyage in search of the N.W. passage, when for the first recorded time longitude at sea was determined by astronomical observation. In 1613 he commanded a whaling-fleet to Greenland, and in 1615 he was the pilot of the *Discovery* under the leadership of Robert Bylot, when the bay, now called after his name, was discovered. He was killed at Kismis, near Ormuz, in 1622, whilst engaged in an Eng. expedition acting in conjunction with the Persians to drive the Portuguese out of the Persian Gulf.

Baffin Land, an is. lying west of Greenland, called after Baffin, the 17th century-explorer (*q.v.*). The east coast is mountainous and inhabited by Eskimos. The climate is severely cold.

Baffin's Bay, a sea passage extending between N. America and Greenland. It communicates with the Atlantic Ocean by Davis's Strait and with the Arctic Ocean by Smith Sound and Lancaster Sound. It is about 800 m. long, with a mean breadth of 280 m. It was called after

William Baffin, the pilot of an expedition commanded by Bylot which discovered the neighbouring lands in 1616. The whale and seal fisheries are an important feature. Other animals are the walrus, ducks, seabirds, and on the coast-land bears and foxes.

Baffo, or **Baffa** (a Venetian corruption of Paphos), a seaport in the west of Cyprus, an important town in Rom. times, *see* Acts xiii. Called also *New Paphos*, to distinguish it from an older town, now in ruins, built by the Phœnicians.

Bafulabe, a Fr. military station in the Sudan, on the R. Senegal, W. Africa. It has a large fort, and is of considerable commercial importance. Pop. 4000.

Bagagem, a tn. of Brazil in the prov. of Minas Geraes, on the R. Bagagem. Diamonds are to be found in the surrounding district. Pop. about 10,000.

Bagalkot, a tn. in the Bijapur dist. of Bombay on the R. Ghatprabha, trib. of the Kistna. Its manufs. are silk and cotton. Pop. 19,000.

Bagamoyo, a seaport at the mouth of the Kingani R., in Ger. E. Africa, facing the south of Zanzibar. It has no natural harbour, ships having to lie about two miles out, nevertheless it has considerable trade, being the entrepôt for caravan trade with the great lake dist. This has led to its being taken as a starting-point by sev. famous explorers, including Burton, Speke, and Stanley. Pop. 18,000.

The dist. round, also called B., has a very mixed pop., both Africans and Asiatics, who are mainly engaged in growing tropical fruit. Cocoa-nuts do well, and there is a considerable export of copra.

Bagasse (Fr.), sugar trash; the crushed stalks of the cane after all the juice has been expressed. Used as fuel.

Bagatelle (Fr., from It. *bagatella*, a trifle): 1. A thing of no importance. 2. A game, possibly derived from billiards. It is played with balls on a board or table varying in size from 6 ft. by 1½ ft. to 10 ft. by 3 ft. The bed, either slate or wood, is covered with green cloth, and has at its upper end nine numbered cups to receive the balls. Round the sides there is an india-rubber cushion. The balls used are nine in number, generally one black, four red, and four white; the black ball is placed on a spot about 9 in. in front of the first hole, and at the player's end, about 18 in. up, there is a balk line, with another spot behind it from which to start play. These measurements, of course, vary with the size of the table. The balls are struck with a cue, as in billiards, and the object is to drive them into the holes, the black ball counting double. There are sev. forms of B., the most usual being: (*a*) ordinary B. In this game each player sends all the balls up; no score is allowed until the black ball has been touched. (*b*) Fr. game. Two players, or four in partnerships, take part, playing alternately. The rules as to scoring vary slightly in different forms of this game. (*c*) Cannon game. This more resembles billiards, and may be played with either cups or pockets, or both. (*d*) Mississippi. Played with a bridge having nine or more numbered arches (according to the size of the table), through which the balls must be played off the cushion.

Bagdad, a vilayet of Asiatic Turkey. Area 42,643 sq. m. The country is watered by the Euphrates and the Tigris, but the soil is, in general, poor and unproductive. There is a mixed pop. of Turks, Arabs, Jews, Armenians, and Kurds, the number of which is estimated at 852,000. Capital, Bagdad.

Bagdad, an old Mohammedan city, once renowned for its learning and culture, for its extensive, flourishing trade, for its minarets and gardens, and for the Eastern splendour of the life within its palaces. The modern tn. is situated on the eastern bank of the Tigris, and is connected with the old tn. on the opposite bank by two pontoon bridges, 650 ft. and 715 ft. long respectively. It is enclosed by an old brick wall, half in ruins, and a dry moat. The tn. is still visited for its ruined mosques and far-famed bazaars, and countless pilgrims pay their ann. tribute to the anct. tombs. Many nationalities congregate within its walls, Arabs, Turks, Jews, Persians, Armenians, Hindus, Syrians, and Kurds. The religious bodies that predominate are Mohammedans, Shiites, and Sunnites. Trade from Persia passes through B. to Mesopotamia, and is carried partly by boat and partly by caravan. Leather, silk, cotton, and woollen goods are manufactured in the tn.; the prin. exports are leather articles, woollens, oriental fabrics, fruits, dates, skins, feathers, and horses.

762-66 the tn. was built by Abu Jaffar 'Al-Mansur,' the 'Victorious,' the second calif of the Abbasside dynasty, who founded it on the ruins of Seleucia and Ctesiphon. It was enlarged by Haroun-al-Raschid, and for 500 years remained the cap. of the Abbasides, during which time it reached the height of its prosperity and harboured a million and a half people within its walls. It was called *Dar-es-Selam*, the 'Dwelling of Peace.' 1258 Hulaku subjugated the Abbasides; 1393 the city was cap-

tured by Timur. During the 16th century Shah Ismail, the founder of the Persian Sofi dynasty, took possession for a time, but the Turks and Persians repeatedly struggled for the city. In 1638 it was annexed to the Ottoman Empire by Amurath, and still remains the cap. of the Turkish province of Mesopotamia. Pop. estimated at 145,000.

Bagdad Railway. The B. R. or Euphrates Valley Railway scheme to construct a line from Konieh, in Asia Minor, to B. and Basra, and thence on to the Persian Gulf, was again brought forward for discussion in 1899. The Russian and British proposals were rejected, and by a provisional convention preference was given to a Ger. company in 1903. England had a particular interest in the proposed scheme, as the line suggested would provide a short route to India; accordingly in 1903 the British gov. objected to the railway being placed under German control, and discussion followed with a view to putting the line under international control. By the agreement of 1903 it was decided the Ger. group should control 40 per. cent of the cap., the Fr.. through the Imperial Ottoman Bank, 30 per cent., the Austrian, It., Swiss, and Turkish 20 per cent., and the Anatolian Railway 10 per cent. In 1904, 124 m. of the line were completed, from Konieh, through Eregli, to Bugurlu. In 1908 sanction was given to extend the line eastwards from Bugurlu across the Taurus to Adana. At present very little has been accomplished, but it is expected that when the line, with its branches, has been completed, the length of the railway will be some 1600 miles.

Bage, a tn. of Brazil, in the state of Rio Grande do Sul, on the R. Negro, a trib. of the Paraguay. Pop. 23,000.

Bagehot, Walter (1826-77), Eng. journalist, economist, and political writer. He was the son of a banker at Langport, Somerset, took his degree at London University, and was called to the Bar in 1852, but gave up law for literature, while retaining for many years a close connection with banking, which gave practical value to his economic studies. In 1858 he married Miss Wilson, daughter of the first editor of *The Economist*. Being in touch with many leaders in political and commercial life, including Mr. Gladstone, Sir George Cornewell Lewis, Mr. Robert Lowe, and prominent city bankers and merchants, he developed a remarkable faculty for 'seeing things from the inside,' and wrote on politics and finance not as a mere theorist, but as one acquainted with their innermost working. His books, *The English Constitution* and *Lombard Street* show not only observation but deep research into the principles of gov. and finance. The theory of a practical banking reserve is developed by him with great clearness. His *Physics and Politics*, pub. in 1869, was remarkably successful abroad as well as at home. He was for many years editor of *The Economist*, and also helped to edit the *National Review*. His *Literary Studies* and *Economic Studies* were pub. after his death.

Bagelen, a prov. of Java, E. Indies, bound by the Indian Ocean on the S.; pop. 1,500,000.

Bagford, John (1650-1716), a collector of rare books. He was *b.* in St. Anne's par., Blackfriars, and began life as a shoemaker. He acquired a taste for rare books and prints which he collected with great avidity with a view to publishing a history of printing. In 1707 he pub. a prospectus for this work, but it was never accomplished. He formed two collections, known as the 'Bagford Ballads,' in which many old English ditties have been rescued from oblivion. They were ed. by the Rev. J. W. Ebsworth (2 vols., Hertford, 1878) for the Ballad Society. His collections of folios and prints were bought by Lord Oxford and are now to be found in the British Museum. He was one of the revivers of the Society of Antiquaries, and addressed a letter to Hearne on London antiquities, which has been pub. in Leland's *Collectanea*, vol. *i*. *See* Dibdin's *Bibliomania*, pp. 430-7.

Baggaras, a Mohammedan race of Bedouins who dwell in the valley of the Nile. Their chief occupation is cattle-rearing.

Baggesen, Jens (1764–1826), Danish poet, *b.* at Korsör, Denmark, *d.* at Hamburg. While a student at Copenhagen, he pub. *Comic Tales*, 1785. In 1811 he was appointed professor of the Danish language and literature at Kiel, but after three years returned to Copenhagen. He quarrelled with Oehlenschläger, and in 1820 left Denmark and never returned. He wrote much in German as well as in Danish. His most important works are *Labyrinthen*, 1792, and *Parthenais oder die Alpenreise*, 1804. B. excelled in serio-comic satire, but his work often contains passages and lines of great beauty and pathos.

Baggs, Charles Michael (1806-45), an Eng. Catholic bishop, educated at Sedgeley Park, St. Edmund's College, Hertfordshire, and the Eng. College, Rome. He became professor of Heb. at the Eng. college, and its vice-rector and rector, 1840, in succession to Wiseman, monsignore to Pope Gre-

gory XVI., and bishop of Pella, 1844. He was appointed vicar-apostolic of the western dist. of England, and pub. works on religious controversy and ecclesiastical archæology.

Baghal, or **Baghul**, a small native state in the Punjab, not far from Simla. Area 124 sq. m.; pop. 25,000.

Baghelkand, a dist. in the N. of Central India, including sev. native states, of which the chief is Rewa; others are Nagode, Mahar Sohawal, and Kothi. Until 1871 they were included in the Bundelkand agency. Area 14,000 sq. m.; pop. 1,500,000.

Bagheria, or **Bagaria**, a tn. at the eastern end of the Bay of Palermo, Sicily, once the favourite residence of the chief Palermitan families. Now much decayed. Pop. 18,000.

Baghermi, or **Bagirmi**, a country in Central Africa, bounded on the W. by Bornu and Lake Tchad, and on the N. and E. by Wadaï, to which it is subject. The country is for the most part a fertile plain, well watered by the Shari R. and its tributaries. The majority of the inhabitants are negroes, though there are some Fulahs and trading Arabs; they wear little clothing, and, though Mohammedanism was introduced in the 16th century, appear to be ignorant and grossly superstitious. They have, however, a well-disciplined army and regular gov. in the cap., Maseña. By the Anglo-German agreement of 1893, the country was recognised as being in the Ger. sphere. Area about 71,000 sq. m. Pop. estimated at 1,500,000.

Baghistan, *see* BEHISTUN.

Bagimont's Roll, originally named from Bagimund di Vicci, or Vitia, who was sent by Pope Gregory X. to assess the church revenues of Scotland for the purpose of raising a crusading fund, A.D. 1274. The Scotch clergy wished to retain the old assessment as a basis, but Bagimund, under Pope Gregory's instructions, insisted on a new return, founded on the real value at the time of inquiry, 1275. Part of this return has been preserved, and is known as B. R.

Baglioni, Cesari, *b.* at Bologna. An Italian painter, studied under his father, an artist of little note. Became a disciple of the Caracci, whose style he adopted particularly in landscapes. He excelled in historical subjects as well as in paintings of animals, fruit, and still life. His best known works are the 'Ascension' and a picture of St. Anthony and Martha. Died at Parma about 1596.

Baglioni, Giovanni (1594–1644), *b.* at Rome. An Italian painter, studied under Francesco Morelli. His patron was Pope Paul V., for whom he executed frescoes for churches, and in consequence obtained a knighthood. He wrote the lives of Roman artists who flourished between 1572 and 1642.

Baglivi, Giorgio (1669–1707), *b.* at Ragusa, Sicily. An Italian physician, studied at Salerno, Padua, and Bologna, and in 1692 went to Rome and became professor of anatomy and medicine at the college La Sapienza, where he died. Pub. *De Fibra Motrice*, in which he expounded his theory of 'solidism' as opposed to *Galenism* or *humorism*.

Bagnacavallo, an old town in Emilia, Italy, 11 m. W. of Ravenna. Formerly called Tiberiacum. Pop. 15,000.

Bagnacavallo, Bartolomeo (1484–1542), an Italian painter, native of the above; real surname, Ramenghi. He was a pupil of Raphael, and leader of the 'Bolognese' school.

Bagnara, a tn. in the prov. of Reggio di Calabria, Italy, nearly opposite Messina. Founded by the famous Robert Guiscard, Duke of Apulia and Calabria, in the 11th century; suffered from earthquake in 1783, and in the great shocks of Dec. 1908, almost every house was laid in ruins.

Bagnères-de-Bigorre, a watering-place in the dept. of Hautes-Pyrénées, France, situated on the Adour. The Romans called it *Aquæ Bigerrionum* or *Vicus Aquensis*. There are many springs of sulphate of lime, and the town is visited by numerous invalids and tourists. Pop. (1906) 6661.

Bagnères-de-Luchon, a popular watering-place in the dept. of Haute-Garonne, France, near the Spanish frontier. There are 48 mineral springs which are visited annually by about 36,000 persons. The Romans knew it as *Balneariæ Lixoviensis*. Pop. (1906) 3448.

Bagnes, the name given to the Fr. convict prisons which were substituted for the galleys in 1748. As the latter had naturally been stationed at the naval ports and arsenals, the B. were estab. in the same localities, and remained until the middle of the 19th century. About 1852, the last three, at Brest, Rochefort, and Toulon, were closed, and convicts were deported to Cayenne. The miseries of prisoners in the B., like those of galley-slaves, were extreme, and have often been described by writers of fiction. Jean Valjean, in Hugo's *Les Misérables*, was a sufferer there. The word *bagnes* is said to be derived from the Italian 'bagnio' (*q.v.*).

Bagnes, Val de, a valley in the W. of Switzerland, canton Valais. Its lower end opens into the valley of the Rhone, near Martigny. A terrible catastrophe occurred here in 1818: the R. Dranse was for two months completely blocked by falls from the

Getroz glacier; when the ice-dam burst the valley was devastated by a flood 90 ft. deep.

Bagni di Lucca, a commune of Lucca, Italy, noted for its warm springs, temp. 98° to 130°, which give off CO_2, and contain lime, magnesium, and sodium. These springs are in the Val di Lima, and are mentioned as far back as 1284, but were first made widely known by the celebrated physician Fallopius, in 1569. Chief resorts, Ponte Serraglio (pop. 1300) and Bagno Caldo.

Bagni di San Giuliano, a tn. of Tuscany, 5 m. from Pisa, Italy. It has mineral springs and manufs. soap and candles. Pop. 21,000.

Bagnio, an Italian word signifying a bath, also used in other senses. The B. at Galata (Constantinople) was a place of detention for slaves: in London (18th century) a B. was a house of ill fame.

Bagno a Ripoli, a vil. 5. m. from Florence, with warm baths. A favourite residence of wealthy Florentine families.

Bagno in Romagno, a watering-place 35 m. E. by N. of Florence, on the R. Savio, near its source; has hot springs (about 110°) containing natron.

Bagnoles, a vil. in Orne, France, 13 m. S.E. of Domfront. It has hot and cold mineral springs.

Bagnolet, a Fr. vil. in the Seine dept. It has gypsum-quarries and fisheries. Pop. 9000.

Bagnols-les-Bains, a vil. in the dept. of Lozère, France, 8 m. from Mende. It has mineral springs of considerable local reputation.

Bagnols-sur-Ceze, a tn. in the dept. of Gard, France, on the R. Cèze, a trib. of the Rhone, 13 m. N.E. of Uzès. The silk-mills, built on the banks of Cèze, are the chief industrial feature of the town. Fine wines are also produced. There is a handsome 'place,' surrounded by arcades and adorned with a fountain. It is supposed that the Roms. had baths here, as some anct. monuments have been found from time to time. Pop. (1901) 4179.

Bagnone, an Italian tn. in the prov. of Massa e Carrara, at the foot of Mt. Orsajo. Pop. about 1000.

Bagoas (Persian *Bagoi*), a name often given to eunuchs. The best known of these (called by Josephus, Bagnoses), was vizier of Artaxerxes III., and practically master of the Persian kingdom. He murdered two kings in succession, and tried to poison Darius III., but the king was warned, and made B. drink the poison himself. *See* JOSEPHUS and DIODORUS.

Bagpipe, a musical instrument of very ancient origin, being a development from the primitive reed-pipe. Its essential characteristics are the bag for the wind-supply and the peculiar 'drone' which furnishes the ground bass. The former may be inflated either by a blow-pipe, as in the Highland B., or by a bellows worked by the arm, as in the musette (Fr.) and the Northumbrian pipes. Every instrument has these principal parts: (1) the wind-bag; (2) the chanter, or melody-pipe, which always has a double reed, and lateral holes for fingering; (3) the drones, which have each but one invariable sound, but can be tuned by means of sliding joints. The compass of the chanter ranges from nine notes in the Highland pipes to twelve in the Irish and fifteen in the Northumbrian. The musette, as improved by Hotteterre in the 17th century, had a much wider range, and was very popular at France, being played at court and in the opera; Sully wrote special music for it. In listening to a Highland pipe it will be observed that the notes of the chanter do not correspond with those of the diatonic scale, and are not strictly in tune. The same note cannot easily be repeated without the interpolation of grace notes, known as warblers; these, introduced to overcome a difficulty, form one of the chief beauties in pipe-music, 'brilliance in his warblers' being one of the distinguishing marks of a skilful player. The B. is suitable both for solemn funeral marches and laments and for the liveliest dances, and is wonderfully inspiriting, both in war and festivity, to those races whose national instrument it is. As for its antiquity, a drone-pipe with reed complete has been found in an Egyptian mummy-case; and it has been asserted that the 'dulcimer' of Daniel iii. should be 'bagpipe.' This is not proven, but it is curious that the original word *sumponya* is very like the name *sampogna*, by which the B. was known in Italy during the middle ages. The Roms. had pipes and introduced them into Southern Britain, whence they spread into Caledonia and Ireland, and survived there after they died out in England. They are mentioned in Ireland as early as (possibly) the 5th century. The modern Irish 'union-pipe,' like the musette, is blown by bellows worked by the arm. The old Ger. *dudelsack* was made in sev. forms varying in their range: one is said to have had separate chanters, on which a two-part melody could be played.

Bagradas, now called Medjerda or Mejerda, an African riv., which rises in the Great Atlas and flows in a north-easterly direction into the Gulf of Tunis. Its length is nearly 300 m.

Bagratidæ, a line of monarchs forming the 'third dynasty' in Armenian history, founded in A.D. 885 by Aschod I., who claimed to be descended from King David of Israel. Armenia was then a trib. kingdom under the caliphate. The rule of the B. was for two centuries prosperous; some fine ruins of their cap., Ani, still remain. In the 11th century, owing to civil war, the Armenian kingdom broke up, the Byzantine empire appropriating a share, and the Turks the remainder. The B. retired to Georgia (conquered by them *c.* A.D. 1000), and ruled there until 1800, when Georgia was annexed by Russia.

Bagration, Peter Ivanovitch, Prince (1765-1812), Russian general, descended from the Georgian branch of the Bagratidæ. He entered the Russian army in 1782, took part in the siege of Ochakov, 1788, and served under Suvarov in Poland, Italy, and Switzerland. In 1805, covering the retreat of Kutusoff's army before superior numbers under Murat, he showed great skill and courage, losing half his men, but saving the main army. He had the experience of serving in sev. lost battles, Austerlitz, 1805, Eylau, and Friedland, 1807, but always won great personal distinction. In 1808 he marched an army across the frozen Gulf of Finland to capture the Aland Is., and in 1809 commanded against Turkey. When Napoleon invaded Russia in 1812 B. commanded the second Russian army. As before he was unsuccessful, being beaten by Davoût at Moghilev, July 23, but succeeded in rejoining the main force under Barclay. On Sept. 7 he was mortally wounded while striving to repel Ney's assault at Borodino.

Bagshaw, Edward (*d.* 1662), an Eng. royalist and author. Graduated at Brazenose College, Oxford, 1608, and entered the Middle Temple. In 1639 he was elected Lent reader, and delivered lectures in favour of Puritan principles. He was elected M.P. for Southwark, 1640, and sat in the parliament convened by Charles I. at Oxford, 1644. He was taken prisoner by the parliamentarians, 1644 – 6, during which time he wrote *De Monarchia Absoluta* and other treatises on political and religious questions.

Bagshot Sand forms part of the Upper Eocene strata found round London, especially in Surrey, and stretching as far S. as the Isle of Wight. The heaths of Surrey and Hampshire belong to this formation.

Bagster, Samuel (1772-1851), founder of the publishing firm of Samuel Bagster & Sons: he began as a bookseller in the Strand in 1794, and in 1816 removed to Paternoster Row. The firm is famous for its editions of polyglot Bibles, including the *Biblia Sacra Polyglotta Bagsteriana*, 1817-28, for an octoglot ed. of the Church of England liturgy, 1821, and for *The English Hexapla*, 1827. It has also published lexicons in many languages.

Baguette, or Baguet (Fr. a small wand), a term used in architecture for a small convex moulding of semicircular section of the same type, as the astragal. When ornamented it is called a chaplet.

Bagul, *see* BAGHAL.

Bahamas, formerly called Lucayos, a group of is. forming a div. of the British W. Indies. They are situated in the Atlantic Ocean, lying to the S.E. of Florida, and N. of Cuba and Hayti. There are about 3,000 is. in all, including coral reefs, but only twenty are inhabited. The prin. is. are New Providence, Great Bahama, Abaco, Cat Is., Harbour Is., Andros Is., Acklin Is., Watling's Is. Eleuthra, and Mariguana. The area is about 4400 sq. m., but it has been estimated up to 5450 sq. m. The is. are long and narrow in shape, and of a low surface, the highest alt. being not more than 230 ft. The climate is so temperate that the is. have come to be a popular winter resort for Americans. There is excellent pasture land, and the soil is fertile. The chief agric. products are maize, cotton, corn, oranges, pine-apples, bananas, tomatoes, grapes, tamarinds, olives, and spices. The sugar-cane is cultivated, and there is valuable timber. A large quantity of sponges is found along the shores. The constitution consists of a governor, assisted by executive and legislative councils of nine members each, and a representative assembly of twenty-nine. All white men over twenty-one who have resided twelve months in the is. have a vote. The cap. is Nassau, New Providence. The B. were visited by Columbus in 1492, but his exact landing-place is not known. The Spaniards did not consider the land sufficiently productive to warrant a colony, but they depopulated them by carrying the Indians away as slaves. In 1629 the English made a settlement on New Providence, but were driven out by the Spaniards in 1641. From 1641 the is. were held alternately by British and Spanish colonists, according to the vicissitudes of war, until finally they came under British sway by the treaty of Versailles, 1783. During the American War, Nassau increased greatly in importance, through its being used as a station in the blockade-running trade. To encourage trade, it was made a free port in 1787. The B. have been visited by disastrous hurricanes,

notably in 1866 and 1883. Certain interesting remains, such as stone hatchets and utensils for domestic use, belonging to the aborigines of the is., have been found. Some of the inhab., known as 'wreckers,' make a living by piloting distressed vessels through the numerous reefs and shoals that surround the is., and by rescuing salvage, of which they are allowed a legal share. Among the religious sects of the community Wesleyans and Baptists predominate. The Church of England was disestablished in 1869. Pop. (1901) 53,735. In 1908 it was estimated at 60,283, of which the majority were negroes.

Bahar (*district*), *see* BEHAR.

Bahar (town), *see* BEHAR.

Bahawulpur, a native state in the Punjab, under British supervision. The dist. round the Ghara and the Indus is very fertile in all kinds of grain and fruit. Big game, such as tigers and boars, abounds. Other animals are camels, cattle, buffaloes, and goats. Area 17,285 sq. m.; pop. (1901) 720,700. The cap. has the same name as the state. The manuf. of turbans, silk girdles, scarves, chintzes, flowered cottons, etc., is the chief industry. Pop. (1901) 18,716.

Bahia, an eastern prov. of Brazil, bounded on the N. by the states of Pernambuco and Piauhy, on the S. by Minas Geraes, on the W. by Goyaz, and on the E. by the Atlantic Ocean. The land by the coast is fertile and woody, the climate being hot and moist. The interior is rocky, with plateaus rising in terraces, and the climate is dry. The country is watered by the R. Sao Francisco and its tribs. The prin. products of the soil are sugar, tobacco, coffee, cotton, Indian corn, and rice. Rubber trees have been cultivated of late, and there are whale fisheries along the coast. Area 164,649 sq. m.; pop. (1893) 2,000,000.

Bahia, or São Salvador da Bahia, cap. of the state of B.; see of an archbishop, and a university tn. As well as the university, there is a medical college, a normal school, a museum, and a magnificent public library. Seaport, with a flourishing shipping trade. There is a fine harbour, protected by the natural breakwater formed between the Is. Itaparica and the mainland. The chief industries are boots and shoes, hats and cotton materials, which are exported along with agric. produce, hides, and jute-wares. The city was visited by Amerigo Vespucci, 1503, and again by Correa, a Portuguese, in 1510. It was colonised in 1536 but abandoned, and refounded, 1549. Up till 1824 it belonged to the Portuguese (except for a brief period when it was held by Holland, 1624), and then proclaimed its independence. Pop. (1902) estimated at 230,000.

Bahia Blanca, a city 3 m. up the R. Naposta, prov. of Buenos Ayres, Argentina. Its port on B. Bay has been much handicapped by a shallow channel, but dredging operations are expected to maintain a minimum draught of 30 ft. B. B. was founded in 1828; its prosperity dates from 1885, when the first railway was opened. It exports wheat, wool, and hides. The naval station of Puerto Militar lies just below the city. Pop., B. 12,000; including port, 70,000.

Bahia de Todos os Santos, *see* ALL SAINTS' BAY.

Bahia Honda, a seaport in the N.W. of Cuba, about 50 m. from Havana; trades in sugar and mining products. Its harbour is one of the deepest and most spacious in Cuba. Pop. 1300.

Bahlingen, a tn. and dist. in the S.W. of Würtemberg, in the region of the Black Forest. The dist. lies along the vale of the R. Eyach, and is noted for its sulphur baths.

Bahr, an Arabic term meaning sea, or large riv., as Bahr-el-Abiad and Bahr-el-Azrek, the White and Blue Nile. A dry river-bed is sometimes called Bahr.

Bahr, Johann Christian Felix (1798-1872), *Ger. philologist*, was *b.* at Darmstadt, and educated at the Gymnasium there and at Heidelberg University, where in 1823 he was appointed professor of classical philology. His works include *Geschichte der römischen Litteratur*, a standard book on the subject, and sev. vols. on the Christian poets, historians, and theologians of Rome, also on the literature of the Carolingian period. He brought out an excellent edition of Herodotus.

Bähr (or Bæhr), **Karl Johann** (1801-69), a painter of portraits and historical subjects. He was *b.* at Riga, studied under Matthæis in Dresden, and travelled in Italy. He later settled in Dresden and was appointed professor at the Academy of Fine Art, 1840. The following paintings may be mentioned: 'Portrait of Julius Mosen,' 'Christ on the Cross' (at Zchopau), 'Iwan the Cruel of Russia, warned of his death by a Finnish Magician' (1850, in the Dresden Gallery), and 'Virgil and Dante.'

Bahraich, a tn. of Oude, on the R. Sarju; has a sacred shrine much visited by pilgrims. Pop. 27,000. The dist. of B. has an area of 2600 sq. m. Pop. over a million.

Bahramabad, a Persian tn. in the prov. of Kerman, noted for its fields of poppies; pop. about 13,000.

Bahramghat, a vil. in the United Provs., India, on the R. Gogra, which is here crossed by a bridge of boats.

It trades in timber and furniture. Pop. 3000.

Bahr Bela Ma, or 'The Waterless Sea,' a valley in the Libyan desert, 50 m. W. of Cairo. It is 9 m. long, very deep, and utterly dry and barren, but has been a watercourse. Some assert, on the strength of a passage in Herodotus, that a branch of the Nile once flowed here.

Bahrdt, Karl Friedrich (1741-92), Ger. theologian and profligate, who had a most extraordinary career. Son of the pastor of Bischofswerda, he was much neglected in his boyhood, and when he became a theological student, though clever, ambitious, and eloquent, he displayed a strangely warped character. After rising to considerable eminence as lecturer, preacher, and professor of biblical philology at Leipzig, he was abruptly dismissed on account of his scandalous private life. He succeeded in obtaining an unpaid professorship at Erfurt; to maintain himself he took pupils and kept an inn, but his recklessness and coarse behaviour brought about another failure. He was, however, still reputed so orthodox that he got an appointment as professor of theology at Giessen; here, in addition to his private excesses, he pub. a so-called *Translation of the New Testament*, so scurrilous that the authorities expelled him. After some years of wandering and privation he settled in Halle, got permission to lecture on anything except theology, and set to work to invent a new system of morality which should supersede Christianity. He also cast off his wife, taking a mistress instead, and turned once more to inn-keeping. In 1789, being sentenced to two years' imprisonment, reduced by the king to one, for writing against the gov., he spent his time in compiling indecent stories and a disgraceful autobiography.

Bahrein Bay, on the E. coast of Arabia, noted for its pearl fisheries.

Bahrein Island, the largest of a group at the mouth of B. Bay; it is 27 m. long by 10 m. wide, flat on the whole, but having in its centre a rocky hill, Jebel Dukhan. The chief town of B. is Manameh. The next largest are Moharek, situated on a neighbouring smaller island, and Sitrah. The whole group is fertile, producing rice, herbs, and fruit; fish are abundant, and the pearl fisheries of B. have been famous for centuries. The islands, which have belonged to many nations in turn, are now under British protection, and are governed by a sheik. On B. itself there is an immense collection of huge sepulchral tumuli, enclosing tombs of limestone; some of these have been examined, and in them were found Phœnician relics. Religion, Mohammedan. The pop. of the islands, numbering altogether about 100,000, are a mixed race, mainly Persian and Arab.

Bahr-el-Abiad, or White Nile, in Africa, rises from Lake Victoria Nyanza, and is one of the chief branches of the main Nile. It is the Upper Nile, joined at Khartum by Bahr-el-Azrek. It flows through about 2300 m. of flat marshy country, and is fed by the trib. riv. Sobat on the E., and Bahr-el-Ghazal on the W.

Bahr-el-Azrek, *see* AZREK.

Bahr-el-Ghazal: 1. A western trib. of the White Nile (or Bahr-el-Abiad), which it joins at Sobat. This riv. is largely responsible for the floating vegetation, called the *sudd* of the Nile. It gives its name to the dist. of Sudan through which it flows, which was formerly leased to the Congo Free State, but now, since 1906, comes under the British sphere of influence. 2. Another riv. of the Sudan, which rises in the eastern end of Lake Chad, and flows in a north-easterly direction, until it spreads out into the marsh or lagoon of the Bodele.

Bai, Bais, or Baj, Tommaso (*d.* 1714), Italian musician and composer, was born near Bologna in the second half of the 17th century, and became master of the chapel of the Vatican. He is celebrated on account of his beautiful *Miserere*. His death took place in Rome.

Baiæ, or Baja, a sm. tn. Campania, with grand ruins, 10 m. W. of Naples. In Rom. times it was a renowned watering-place, with warm sulphur springs: it had immense baths and palatial residences, and was a favourite resort of the Cæsars. Nero built a fine villa here, and Hadrian died in one that had belonged to Julius Cæsar. B. had from early times a disgraceful reputation for immorality: Cicero once apologised for defending a man who had lived there. The littoral is strewn with foundations and remains of walls. The most notable relics of antiquity are the temples of Venus, Mercury, and Diana.

Baiardi (or Baiardo), Ottavio Antonio (*c.*1690–*c.*1765), Italian antiquarian, was *b.* at Parma. His genius was recognised by Charles III., who made him decipher some monuments of Herculaneum. His single known pub. work was the *Prodromo dell' antichita d'Ercolano*, 1742.

Baiburt, a tn. of Turkish Armenia, on the Tchoruk-See, about 65 m. W.N.W. of Erzerum. It has an imposing castle, and there are manufs. of carpets and cutlery. Pop. (estimated) 10,000.

Baidyabati, a tn. of Bengal, India

on the Hugli, opposite Barrackpur, and 15 m. N. of Calcutta. There are manufs. of jute and hemp rope. Pop. (estimated) 20,000.

Baiersbronn, a tn. of Würtemberg, Germany, in the region of the Black Forest, dist. Freudenstadt; pop. (1900) 6414.

Baif (or **Bayf**), **Jean Antoine de** (1532-89), a Fr. poet, born at Venice. He studied under Ronsard, and made particular progress in Gk. He was a member of the Pléiade, and attempted to write Fr. verses with cadence and accent of Gk. and Lat. poetry. These verses he set to music, and in 1561 pub. *Twelve Hymns or Spiritual Songs*, and in 1578 sev. books of songs. He founded an 'Académie de poésie et de musique,' 1567-84, in Paris, which was the first of its kind. His poems were pub. in two vols., *Euvres en rime* and *Les Jeux*, in 1573 at Paris, and consist of serious, comic, and sacred pieces. His *Poésies choisies* have been ed. by Becq de Fonquières, 1874, and his *Mimes, enseignements et proverbes*, by Blanchemain, 1880. *See* Nagel, *Die Metrischen Verse J. A. de Baifs*, Leipzig, 1878.

Baigorry, Valley of, in the Basses-Pyrénées, France, contains copper and iron mines; the former date back to Roman times. Prin. town, St. Etienne de Baigorry.

Baikal, the largest fresh-water lake in Asia, situated in Southern Siberia on the border of Irkutsk and Transbaikalia, called the 'Holy Sea' of the Mongols, and said to be the deepest lake in the world. It is 390 m. in length, and 20-50 in breadth, the area being 12,500 sq. m. The greatest depth is 4500 ft., the lake being 1513 ft. above the sea-level. Its chief tribs. are the Selenga and Bargusin, and its outlet the Lower Angara, a trib. of the Jenisei. There are many is., the largest of which is the Olkhon. The lake is surrounded by the B. Mts., a spur of the Altai. The fishing industry is very important, the prin. fish caught being sturgeon, salmon, and seals. A curious fish called the golomynka (Comephorus Baicalensis) was once found in great quantities, but is now very rare. It consists almost entirely of fat, which, melted down, can be used for train-oil. Many wild animals are found on its borders, such as deer, elk, musk-goat, otters, gluttons (Ursus gulo), lynxes, foxes, and wolves. The neighbouring region is volcanic. The lake is covered with ice from November to April, but traffic between Russia and China continues all the year round. The settlers on the shores are Russians, Buryats, and Tunguses.

Baikalean Mts., a name sometimes applied to all the ranges which enclose Lake Baikal, Siberia, but properly belonging only to those on the western side. They are about 500 m. in length, and average 3000 ft. in height. Granite and marble abound, and there is much iron ore; lapis-lazuli is also found. The people of this region are the Buriats.

Baikie, William Balfour (1824-64), Scottish explorer and naturalist, was *b.* at Kirkwall, Orkney. Obtaining his M.D. degree at Edinburgh in 1848 he became a surgeon in the royal navy, and in 1854 was appointed surgeon and naturalist to the *Pleiad* expedition, sent to explore the Niger. The chief officer dying, B. took command, and succeeded in going 250 m. further than any previous explorer, without losing another man. In 1857 he again went out in the *Pleiad;* the ship was wrecked up the Niger, and his party returned home, but he remained in the country, and single-handed laid the foundation of our present colony of Nigeria. He obtained such influence over the natives as only once in seven years to have recourse to arms. He studied many native languages, and trans. parts of the Bible into Haussa. He died at Sierra Leone, on his way home, in 1864.

Bail, in law, when a person is charged with an offence he may be released on security given by one or more persons, usually householders, that he will appear at the trial. He is then on B., or in the B., *i.e.* custody of the person giving B. or security. If he fail to appear, the B. is forfeited. If the sureties think the bailed person will not appear, they may surrender him, and be relieved of liability. A justice may now dispense with sureties and release the accused on his own recognisances if he be of opinion that justice will not be defeated. In felonies other than treason and in certain misdemeanours the magistrate may in his discretion admit to bail, but is not obliged to do so. In all other misdemeanours and in all summary cases the magistrate is bound to admit to B. In practice, however, B. is never allowed in a charge of murder, or in misdemeanours where the costs of prosecution may be allowed out of the county rate. In treason it can only be granted by a judge of the King's Bench Division or a secretary of state. The police may grant B. if, on arrest without warrant, the prisoner cannot be tried within twenty-four hours. In Scotland (Bail Act, 1888), murder or treason are the only non-bailable offences. The High Court and the lord advocate can admit to bail.

Baildon, a tn. in the W. Riding of

Yorkshire, England, 4 m. N. of Bradford, in the Otley div. There are sev. industries, including worsted mills and chemical works. Pop. (1901) 5797.

Bailen, or Baylen, a tn. in the S. of Spain, 21 m. N. of Jaen. Here Dupont with 17,000 Fr. soldiers had to surrender to the Spaniards in 1808. Bailen is a mining centre. Pop. 7500.

Bailey, that part of a castle or fortress lying round the central keep; sometimes there are two enclosed spaces, the inner and outer B. The name is probably of Fr. derivation.

Bailey, Old, *see* OLD BAILEY.

Bailey, Nathan (*d.* 1742), Eng. lexicographer and philologist. His *Dictionarium Britannicum*, pub. in 1730, a great improvement on previous lexicons, went through many eds., and was taken by Dr. Johnson as the basis of his great dictionary twenty years later. B. was a schoolmaster at Stepney.

Bailey, Peter, an Eng. writer and poet. He founded the review *Museum* and wrote many poems, of which the best is *Idwal*. He died in 1823.

Bailey, Philip James (1816-1902), was *b.* and educated at Nottingham; in 1835 he went to London, and entered Lincoln's Inn, but did not take up the legal profession in earnest. In 1839 he published his poem *Festus*, which had a great success here and in America. It is practically his only book, a philosophical and theological drama, with many fine thoughts and eloquent passages, but as a whole confused and to most readers even tedious.

Bailey, Samuel (1791-1870), was the son of a Sheffield merchant, and for some years took an active share in business. A liberal in politics, he twice contested Sheffield as a 'philosophic radical,' but without success. His first book, *Essays on the Formation and Publication of Opinions*, appeared in 1821, and a sequel, *On the Pursuit of Truth*, in 1829; they were both widely read. Other philosophical works were *Theory of Reasoning*, 1851, and *Letters on the Philosophy of the Human Mind*, 1856-63. He also wrote several books on economics, the chief one being a *Critical Dissertation on Value*, 1825—a strong attack on Ricardo's theories. In philosophy he displays great clearness and originality of thought; rather a utilitarian than an idealist, he yet objects to the word 'utility' as being narrow and liable to misconception.

Bailey, Solon Irving, an American astronomer, born at Lisbon, New Hampshire, 1854. He graduated at Boston University, 1881; became associate professor of astronomy at Harvard; estab. a southern station of the Harvard Observatory at Arequipa, Peru, 1889; and estab., on the summit of Mt. Misti, the highest scientific station in the world, at an elevation of 19,000 ft. (1893). He has contribute[illegible] the *Annals* of [illegible]ory.

Bailey, [illegible] miscellaneous [illegible] as a silk-hosier at Nottingham, and was a member of the town council 1836-43. In 1845 he became proprietor and editor of the *Nottingham Mercury*, but his politics proved distasteful to his readers and the paper became extinct in 1852. In his later years he retired to Basford, near Nottingham, and devoted his time to writing and collecting books and engravings. He was the author of numerous poems, and some political and topographical works, which include *Discourse on Political Revolutions*, 1830; *Village Reform*, 1854; *Annals of Nottinghamshire* (4 vols.), 1852-5.

Bailie, or Baillie, a superior officer or magistrate of a municipal corporation in Scotland. They are invested with certain judicial and administrative authority within the city or burgh for which they are appointed. They are assisted by a paid legal adviser called an 'assessor.' The office is in some respects analogous to that of alderman in England, but unlike an Eng. alderman he retains his seat for the ward to which he has been appointed after selection as a B. The term of office is three years. The chief magistrate or 'provost' and one or more of the Bs. are, *ex officio*, in the commission of peace. There are also Bs. of regality and barony, who are appointed by the superior or overlord of the manor. The B. of Holyrood or B. of the Abbey, appointed by the Duke of Hamilton as hereditary keeper, has jurisdiction in all civil debts contracted within the precincts. The B. who gave sasine or seisin was the person who appeared for the seller at the ceremony of giving sasine or delivery of lands. This practice was abolished in 1845.

Bailiff. In general the word means superintendent, or keeper, one who is entrusted with a charge. Derived from Fr. *bailie;* cf. Lat. adj. *bajulus*, a carrier, afterwards a carrier on, or administrator. In Constantinople the name *bajulos* was given to the tutor of the sons of the Gk. emperor; also to the superintendents of foreign merchants; and the word *balio* signified the Venetian ambassadors.

In Eng. law, B. signifies a superior steward or agent. The keeper of Dover Castle is still called the king's B., and the name is also applied to magistrates of certain corporations in England.

The name now generally applies to

the sheriff's officers. Such are either Bs. of Hundred or special Bs. The former are appointed by the sheriff to collect fines, summon juries, execute writs and processes, and attend at assizes and quarter sessions. The latter are men selected for their skill in hunting and apprehending persons liable to arrest. Being compelled to enter into an obligation for the due performance of their duties, they are sometimes called *bound-bailiffs*, or vulgarly bum-bailiffs. Special Bs. are appointed at the request of a *suitor and the sheriff is not responsible* for what is done by them. A B. cannot lawfully act until he has received a warrant under the hand and seal of the sheriff.

Bs. of a franchise or liberty are appointed by the lord of a liberty. They exercise jurisdiction in certain parts of the country, *e.g.* the liberty of Gower in Gloucestershire.

The high B. of a co. court appoints sub-bailiffs who execute process of the court. His office is for life.

Bailiwick, a legal term used with regard to the co. or dist. with which the sheriff, as bailiff of the king, has *jurisdiction*.

Baillarger, Jules Gabriel Francois (1809-91), a Fr. doctor, born at Montbazon, Indre-et-Loire. He specialised in mental diseases, and was awarded a prize for his essay *Des hallucinations, des causes qui les produisent et des maladies qu'elles caractérisent*, by the Academy of Medicine, 1842. With Longet and Cerise he founded the review *Annales médico-psychologiques du système nerveux*. He was awarded the medal of the Legion of Honour for his services during an outbreak of cholera, 1849.

Baillet, Adrien (1649-1706), an eminent Fr. critic, born of poor parents at Neuville-au-Hez, near Beauvais in Picardy. He studied in a neighbouring convent, where he was introduced to the bishop of Beauvais who assisted him in obtaining a good education. In 1676 he received holy orders and was given the vicarage of Lardières; in 1680 he became librarian to M. Lamoignon, the advocate-general. His *Les Enfants devenus célèbres par leurs études et par leurs écrits* (Paris, 2 vols., 1688) won great popularity. His principal work is *Jugements des savants s*
auteurs
a life of J
historical works.

Bailleul, a tn. in France, arron. of Hazebrouck, dept. of Le Nord. It is an old Flemish tn. and has a museum of paintings and antiquities. The church of Saint Vaast and the *hôtel-de-ville date from the 14th and 15th* centuries respectively. The chief industry is hand-made lace, and it has *manufs. of woollens, linens*, cheese, earthenware, and soap. Pop. (1901) 11,899.

Bailleul, Jacques Charles (1762-1843), Fr. advocate and politician, was born at Bretteville, near Havre. He sat as a member of the Convention in 1792 and a year later was proscribed. He wrote a refutation of Madame de Staël's work on the Revolution in 1818, and numerous pamphlets on political and financial questions. He died in Paris.

Bailliage, a Fr. term, equivalent to bailiwick. The word was used more especially in Switzerland of portions *of ter. over which a bailiff was ap*pointed. This officer was in charge of the police and had jurisdiction *in* certain civil and criminal causes. In case of maladministration, appeal lay to the cantons to which the B. belonged.

Baillie, Lady Grisell (Grizel Hume), 1665-1746. A Scottish poet, born at Redbraes Castle, Berwickshire, daughter of the patriot, Sir Patrick Hume, first Earl of Marchmont. In 1684 she supplied her father with food *during his confinement in the vault* of Polwarth
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1692 she m
B. of Jerviswood. Her ballads may be found in Allan Ramsay's *Tea-Table Miscellany* (1724-7). The best known of her songs is *And werena my Hear licht I wad dee*. Memoirs of her were written by her daughter Lady Grizel Murray of Stanhope (*1693-1759*).

Baillie, Joanna (1762-1851), a Scottish poet and dramatist, born at Bothwell, Lanarkshire, but went to live at Hampstead, where she died. Th *Plays of Passion* (1798-1836) ar artificial in conception and lacking in dramatic incident, but they ar written with vigour and a certain im pressive dignity. *De Montfort* had a vogue through the acting of John Kemble and Mrs. Siddons. She is a her best in simple pieces, in her song and ballads written in the Scottish dialect.

Baillie, Matthew (1761-1823). A Scottish lecturer on anatomy. Educated at Glasgow and Oxford universities. 1787 appointed physician t St. George's Hospital. 1789 fellow of the College of Physicians. After 1810 he acted as physician to the royal family. 1795 *The Morbid Anatomy of some of the most important Parts of the Human Body* had a great influence on the study of medicine.

Baillie, Robert (*1599-1662*), Scotch Presbyterian divine. One of the commissioners appointed to prepare charges against Archbishop Laud, 1640. The first professor of divinity at

Glasgow University, 1642. Sat in the Westminster Assembly of Divines. One of the delegates sent to the continent with an offer of the Scottish crown to Charles II. Prin. of Glasgow University, 1661. His *Letters and Journals*, 1637-62, give an interesting picture of the times.

Baillie, Robert, of Jer.iswood, a Scottish patriot and martyr, who has been called the 'Scottish Algernon Sidney.' He opposed the tyranny of Charles II.'s favourite, the Duke of Lauderdale, in 1676, and was arrested on a charge of complicity in the Rye House plot and was unjustly condemned to death. Hanged at Edinburgh, December 24, 1684.

Baillie, Thomas (*d.* 1802), a British naval officer. He served at Minorca, 1756, and was engaged on convoy service, 1757-60. In 1761 he was moved to Greenwich Hospital, and became its lieutenant-governor in 1774. In 1778 he was brought to trial for libel, having preferred charges against the internal gov. of the hospital, and his defence was undertaken by Erskine, afterwards lord chancellor. He was acquitted, but had been previously deprived of his office which was not restored to him. In 1782 he became clerk of deliveries.

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Paris Museum have been prepared by him. He died at Abbeville in 1803. He was a correspondent of Buffon; his chief works are: *Mémoire sur les causes du dépérissement des bois et le moyen d'y remédier*, 1791; *Sur les sables mouvants qui couvrent les côtes du département du Pas-de-Calais et les moyens de s'opposer à leur invasion.*

Baillon, Ernest Henri (1827-95), a Fr. botanist, *b.* at Calais, and *d.* in Paris. In 1864 he was appointed professor of natural history, and later professor of hygiene at the Industrial School of Art. In 1870 he ed. the *Adansonia*, to which he contributed many botanical articles. Author of *Histoire des Plantes*, 1866-85; *Traité de Botanique Médicale Phanérogamique*, 1884, etc., and a botanical dictionary.

Baillot, Pierre Marie François de Sales (1771-1842), a Fr. violinist. He was *b.* at Passy and *d.* at Paris; received his musical education at Paris under Sainte-Marie, and at Rome under Pollani, a pupil of Nardini. He made his debut in Paris in 1791, and became professor of the violin in the Paris Conservatoire from 1795 till his death. He studied the theory of music under Catel, Reicha, and Cherubini. He entered Napoleon's private orchestra in 1802, and afterwards travelled in Russia with Lamare, 1805-8. In 1814 he organised concerts for chamber music in Paris with great success; toured in Holland, Belgium, and England, 1815-16, and became a member of the London Philharmonic Society; director of the Paris Opera, 1821-31; and of the Royal Orchestra, 1825. B. belonged to the classical school of violin players, and won fame as a teacher. His compositions are difficult, and have been almost forgotten, but *Art du Violon*, 1834, is still regarded as a standard work. Author of *Méthode de Violon* (adopted by the Conservatoire), obituary notices of Grétry (Paris, 1814), and Viotti, 1825, and other occasional writings. Consult Wasielewski, *Die Violine und ihre Meister*, Leipzig, 1893.

Bailly (or Bailli), David (1584-1657), a Dutch artist, born at Leyden. He studied first under his father, Peter B., but was afterwards a pupil of Jacob de Gheyn and Cornelius Vander Vort. He travelled in Germany and Italy, returning to his native tn. in 1613, where he won a reputation as a portrait painter. There is a portrait of Marie Van Reigersbergen, wife of Grotius, painted by this artist in 1624, at Amsterdam.

Bailly, Jacques (1629-82), a Fr. miniature painter, *b.* at Graçay (Cher). He settled in Paris and became a member of the Academy of Painting, in 1664. He etched twelve plates, representing bouquets of flowers, but he distinguished himself more particularly by his portraits in miniature. His works are very rare.

Bailly, Jean Sylvain (1736-93), a Fr. statesman, astronomer, and savant. In 1784 he was elected a member of the Fr Academy, and in 1785 of the Academy of Inscriptions. In 1789 president of the Third Estate and of the National Assembly. Mayor of Paris, 1789-91. He lost his popularity and went into retirement at Melun, where he was seized, brought back to Paris, and executed in 1793 on a charge of conspiracy. 1775-87 *Histoire de l'Astronomie.* Pub. posthumously *Essai sur l'origine des Fables et des Religions Anciennes*, 1799; and *Memoirs of the Revolution*, 1804.

Bailment, a delivery of goods by the bailor to the recipient or bailee to be held according to the purpose of the delivery, and to be restored when the purpose is accomplished. B. is of three kinds: 1. For the benefit of the bailor or his representative. The bailee receives and keeps the deposit without reward, and is responsible only for gross neglect. 2. For the benefit of the bailee or his representative. The bailee receives a gratuitous

loan, which he must return, without payment, at the end of a certain time. He is responsible in this case for the least neglect. 3. For the mutual benefit of the bailor and bailee or their respective representatives. This includes deposit as a security (as when goods are left with a pawnbroker, or when furniture is stored with a warehouseman), and the hiring of the use of a bailed article. He is responsible only for ordinary neglect.

Baily, Edward Hodges (*1788-1867*), an Eng. sculptor, *b.* at Bristol. Went to London in 1807 and entered Flaxman's studio. He won medals from the Society of Arts and Sciences and from the Royal Academy. He was *employed by George IV.* to execute the sculpture in front of Buckingham Palace and the figures on the Marble Arch. He executed a great number of busts and statues of public men, the Nelson monument in Trafalgar Square, *Charles James Fox* and Lord Mansfield in St. Stephen's Hall, Westminster. Among his finest works are: 'Eve at the Fountain,' 'Eve listening to the Voice,' 'Hercules casting Hylas into the Sea, 'Psyche.' 'Girl preparing for the Bath,' and 'The Graces Seated.'

Baily, Francis (1774-1844), Eng. astronomer. In 1827 he was awarded the gold medal of the Astronomical Society for revising their Star Catalogue. He set on foot the reform of the Nautical Almanac, 1829; 1802 *Tables for the Purchasing and Renewing of Leases;* 1808 *Doctrine of Interest and Annuities;* 1810 *The Doctrine of Life-Annuities and Assurances.*

Baily's Beads, the name given to a phenomenon which is observed in connection with the total eclipses of the sun, first fully described by Francis B. (*q.v.*). Owing to the effect of irradiation and the irregularity of the moon's edge, the crescent-shaped portion of the sun that is unobscured by the moon's disc looks like a belt of bright spots in a dark background, which may be compared to a string of beads.

Bain, Alexander (*1818-1903*), Scottish psychologist and philosopher. Educated Mariscal College, Aberdeen, 1836-40; became professor of natural philosophy in the Andersonian University, Glasgow, 1845; secretary of the Board of Health, 1848-50. He acted as examiner in logic and moral philosophy for the London University and for the Indian Civil Se[illegible] he was in Abe[illegible], was made lord rector of his own university, 1881. From 1840 he contributed frequent articles to the *Westminster Review,* Chambers's *Papers for the People* and *Information for the People.* He followed in the steps of Hartley, in that his psychology was based on physiology, and he belonged to the experimental as opposed to the transcendental school. His principal works are: *The Senses and the Intellect,* 1855; *The Emotions and the Will,* 1859; *Study of Character,* 1861; *Mental and Moral Science,* 1868; *Logic,* 1870; *Relation of Mind and Body,* 1873. In addition he assisted in the editing of Grote's *Aristotle* and edited Grote's *Minor Works;* he wrote a biography of James Mill, as well as a criticism of J. S. Mill, and his educational works give valuable suggestions on the writing of English composition and rhetoric.

Bainbergs, plate armour of the 13th century, used to protect the legs.

Bainbridge, Christopher (*c.* 1464-1514), an English prelate. Bishop of Durham, 1507; Archbishop of York, 1508. Henry VIII. sent him on an embassy to Pope Julius I., who appointed him Cardinal of St. Praxede in 1511. He was poisoned by Rinaldo de Modena, a priest, who confessed that the Bishop of Worcester had instigated him to perform the act.

Bainbridge, John (1582-1643), *b.* at Ashby-de-la-Zouch, *d.* at Oxford. An English astronomer and the first Savilian professor of astronomy at the University of Oxford. He pub *Astronomical Description of the Comet of* 1618 (1619), and numerous other works on astronomical and mathematical subjects.

Bainbridge, William (1774-1833), an American naval officer, born at Princeton, N.J. He entered the merchant marine service at the age of fifteen; became a lieutenant in command of schooner *Retaliation* in 1798; was captured off Guadaloupe by the Fr.; in 1800 he was promoted to the rank of captain, and was sent on an embassy to the Dey of Algiers, who [illegible] ice, unde to go to [illegible] mman[illegible] ed the Moorish frigate *Mesbboha* (1803), but was himself taken prisoner off Tripoli. He was appointed commodore in 1812, in command of the *Constitution, Hornet,* and *Essex,* and captured the British frigate *Java.* He took charge of the Philadelphia and Charlestown navy yards, and from 1832-5 he acted on the board of naval [illegible] Morris, *Life of* [illegible] 1837.

[illegible] (1786-1862), entered the navy as a midshipman in 1799, but retired through ill-health. In 1800 the

Duke of York appointed him to an ensigncy in the 20th Regiment; inspector of fortifications at Curaçoa, 1807; entered the senior dept. of the Royal Military College at High Wycombe, 1809, where he invented a protracting pocket sextant; deputy assistant quartermaster-general in Portugal, 1811. He took part with distinction in the Peninsular War and also served in France. He commanded the forces in Ceylon, 1852-4, and was promoted to the rank of lieutenant-general. In 1860 he was created K.C.B.

Baines, Edward (1774-1848), an Eng. journalist and economist, born at Walton-le-Dale, Lancashire. He was apprenticed to a printer first at Preston and then at Leeds; bought the *Leeds Mercury* in 1801; M.P. for Leeds, 1834-41, as an independent Liberal. He advocated the reform of factory laws, Catholic emancipation, and opposed state interference in educational matters. He wrote a *History, Directory, and Gazetteer of the County of York*, 1823, which was enlarged as the *History of the County Palatine and Duchy of Lancaster*, 1868-70; and a *History of the Reign of George III.*, 1823. See *Life*, 1859, by his son, Sir Edward Baines.

Baines, Sir Edward (1800-90), an Eng. politician. Elected member of parliament in 1859, and became the advocate of many reforms; he defended disestablishment of the Irish Church, opposed church tests in the universities, and introduced two franchise bills, in 1861 and 1864. Author of *History of the Cotton Manufacture in Great Britain*, 1853.

Baines, Peter Augustine, D.D. (1786-1843), a Rom. Catholic bishop, born at Kirkby, Lancashire. He was educated at the English Benedictine Abbey of Lambspring, Hanover, and entered the Benedictine order in 1804, and became a priest in 1810. He taught at Ampleforth till 1817, when he undertook the mission at Bath. He won a high reputation as an eloquent preacher, and in 1823 he was appointed coadjutor-bishop to Collingridge, and in the same year was consecrated bishop of Siga. In 1829 he became vicar-apostolic of the western district of England; in this year he bought Prior Park, where he founded St. Peter's and St. Paul's, a lay and eccles. college respectively. He pub. many sermons, lectures, and pamphlets on controversial subjects, the manuscripts of which are preserved at Prior Park.

Baini, Giuseppe (1775-1844), It. priest, musical critic and composer, was *b.* and *d.* at Rome. He was appointed master of the pontifical chapel, and composed numerous musical works, of which the chief are a *Miserere* and the *Memorie storico-critiche della vita e delle opere di Giovanni Pierluigi di Palestrina*, 1828.

Bains, a vil. in the dept. of Pyrénées-Orientales, 4 m. S.W. of Céret. Louis XIV. caused a fortress to be built here in 1670, at the foot of which are two mineral springs. The water is very hot, and is collected in a reservoir, the descent to which is by steps. Over the bath and steps is an anct. vault. The building of this bath has been ascribed both to the Romans and to the Moors.

Bains, or Bains-les-Bains, a vil. in the dept. of Vosges, France, 16 m. S.S.W. of Epinal; it is frequented for its baths and warm springs (86-123° F.), which are recommended for cases of gout and diseases of the chest. Some ancient bronze medals, mostly Rom., but a few Gk., were discovered in 1752 under a large stone placed over one of the springs. Pop. c. 2000.

Baiocco, or Bajocco, a small coin worth about a halfpenny, coined by the papal states, 1-100th part of the scudo = *4s. 3d.*, so called from its brown colour.

Bairaktar, or Bairak-dar (1755-1808), the title of Mustapha, Grand Vizier of Mahmoud II. He was born of poor parents, but distinguished himself in military service. When Pasha of Rustchuk, he fought against the Russians with some success, 1806. On hearing that the janissaries had murdered Selim III. and put Mustapha IV. on the throne, he marched to Constantinople, deposed Mustapha and elevated his brother Mahmoud II. to the throne, 1808. He was then appointed Grand Vizier. His policy was to strengthen the regular army and crush the power of the janissaries. However, his success was short-lived, for in the same year, the janissaries revolted, seized the Seraglio, and demanded the restoration of Mustapha. At first he resisted, but seeing that he would soon be enveloped in flames, he strangled Mustapha and killed himself. The Turkish word Bairakdar means standard-bearer.

Bairam, or Beiram, the name of two great Mohammedan feasts: 1. The Lesser B. is celebrated at the end of the fasting month Ramadan or Ramazan. It lasts from one to three days, and is marked by great rejoicings and the interchange of presents. 2. The Greater B. is held seventy days after the Lesser, and lasts for four days. It was instituted in commemoration of Abraham's sacrifice of Isaac. The faithful of Islam are expected to offer up a sheep, which is divided into three portions, one for the household, one for the relatives, and one for the poor.

Baird, Sir David, Bart. (1757-1829), a British general, *b.* at Newbyth, Haddingtonshire. Entered the service, 1772; served in British India, 1780-89. He was wounded while fighting against Hyder Ali at Pernambucum in 1780, and was taken prisoner and kept in a dungeon at Seringapatam for nearly four years. He was in England on furlough for two years, returning to India in 1791. He took Pondicherry, 1793. In 1799 he led the assault at Seringapatam, Colonel Wellesley (afterwards Duke of Wellington) being in command of the reserve. In 1801 he commanded an expedition to Egypt for the expulsion of the Fr. On his return to India he complained of the preference given to Wellesley, and asked for leave of absence. In 1804 he was knighted and made a K.C.B. Led an army to recapture the Cape of Good Hope from the Dutch settlers, 1806, and served in the siege of Copenhagen, 1807. In 1808 he was sent to the assistance of Sir John Moore with a reinforcement of 10,000 men, and distinguished himself at Corunna 1809. On his return to England, he was thanked by parliament for his services, and received a baronetcy. In 1810 he retired from active service, and failed in his application for a peerage and a pension In 1820 he was appointed commander-in-chief in Ireland, but was not successful as an administrator, and was removed from office in 1821, when Marquess Wellesley became lord-lieutenant. He died at Fern Tower, Crieff.

Baird, James (1802-1876), iron-master, *b.* at Kirkwood, Lanarkshire, son of Alexander B., a coal master. He was for a time at Glasgow University. In 1826, in conjunction with his father and brother, he leased some coal-fields at Gartsherrie, which proved a great success. In 1830 he took the management of the blasting furnaces. From 1842-64 they employed about 10,000 men and boys on their furnaces at Gartsherrie, Muirkirk, and Eglinton, which turned out annually 300,000 tons of iron. M.P. for Falkirk Burghs, 1851-52 and 1852-57. Left a fortune of

[illegible]

Scotland.

Baird, [illegible] an American and author. H[illegible] co., Pennsylvania, and graduated from Jefferson College, 1818. He was agent and secretary of the American and Foreign Christian Union, and worked in Europe on behalf of temperance and a revival of evangelical Protestantism. He wrote *A History of Temperance Societies in the United States*, 1836; *Protestantism in Italy*, 1845; and a *History of the Albigenses, Waldenses, and Vaudois.*

Baird, Spencer Fullerton (1823-87), an American naturalist. Graduated from Dickinson College, Carlisle, Pennsylvania, to which he was elected professor of the natural sciences, 1845. He became assistant secretary of the Smithsonian Institution at Washington in 1850, and secretary in 1878. During this period the National Museum was organised and developed by him. In 1871 he was elected commissioner of fish and fisheries. He wrote numerous books on zoology and American archæology, the most important being: *Catalogue of North American Reptiles*, 1853; *Mammals of North America*, 1859; *Birds of America* (with John Cassin), 1860; *History of North American Birds* (with Dr. Brewer and Professor Ridgeway), 1874-84. He also trans. and ed. from the Ger. *Iconographic Encyclopædia.*

Baireuth, or Bayreuth, a tn. in Bavaria, cap. of the dist., Upper Franconia, on the Red Main, 58 m. N.E. of Nuremberg by rail. It is famous for Wagner's theatre (1876), built especially for the performance of his operas. Among other interesting buildings are the palaces Fantasie and Hermitage. In the latter may be seen the apartments of Frederick the Great, and the room where his sister wrote her memoirs. There are also the houses of Wagner (Villa Wahnfried) and of Jean Paul Richter. The graves of Richter and Franz Liszt may be seen in the cemetery. The tn. was formerly the cap. of a margraviate, ruled by the house of Hohenzollern. There are manufs. of cotton, linen, thread, sewing-machines, agric. and musical instruments. There are also distilleries, breweries, and brick-kilns. The suburb of Sankt Georgen is to the N.E. on a hill. Pop. (1900) 29,384. *See* Meyer, *Das Stadtbuch von Baireuth*, 1896; Barry, *Manual for Visitors*, 1894.

Bairnsdale, a tn. in Victoria, Australia, on the Mitchell R., 37 m. N.E. of Sale; pop. about 4000.

Bairout, *see* BEIRUT.

Baise, or **Bayse,** one of the chief rivs. of the dept. of Gers, France. It is 145 m. in length, and flows from the Hautes-Pyrénées to the Garonne, which it joins at Aiguillon.

Baitul, or **Betul,** a dist. of the Central Provs., British India, which is densely wooded and hilly. Its cap. is Budnur, and the pop. about 300,000.

Baize, a coarse woollen cloth with a long nap, chiefly used for curtains,

linings, coverings, etc., though in some countries it is made up into clothing. It was formerly made of a finer texture.

Baja, *see* BAIÆ.

Baja, a tn. in the co. of Bács, Hungary, noted for its swine fair. The chief trade is in grain, corn, shoes, and alcohol. Pop. (1900) 20,361.

Bajaur, a dist. on the borders of British India, N.E. of Afghanistan, separated from Chitral on the W. by the Lahori Mts. It is a fertile plain, yielding iron ore.

Bajazet, or Bayazid I. (1347-1403), son of Amurath I., on whose death at the battle of Kossova he became sultan of the Turks. He was so active in warfare that he won the title 'Ilderim' (lightning). He conquered Bulgaria and parts of Asia Minor, Servia, Macedonia, and Thessaly. He blockaded Constantinople for ten years, thinking to subdue it by famine. Sigismund of Hungary with a large army, officered by 2000 Fr. nobles, laid siege to Nikopolis, but B. gained a decisive victory over the united forces of Fr., Poles, and Hungarians, 1396. He was, however, defeated in 1402 near Angora by Timur, who kept him prisoner till his death. The literary tradition that he was kept in a cage and fed with bits like a dog (*cf.* Marlow's *Tamburlaine* and Rowe's *Tamerlane*) is entirely without historical foundation. During his sultanship he made praiseworthy efforts to improve the administration of justice.

Bajazet, or Bayazid II. (1481-1512), a Turkish sultan, son of Mohammed II. He ascended the Ottoman throne in 1481. During his reign he conquered Constantinople, and engaged in continuous warfare with his neighbours, particularly with Hungary, Poland, Persia, Venice, and Egypt. The last years of his reign were disturbed by the quarrels of his three sons about the succession to the throne. He finally abdicated in favour of his youngest, Selim, and near Adrianople, on his way to exile. He is said to have died at Aya, near Hassa, and some say he was imprisoned by his son Selim. He was a generous ruler, but under the influence of the janissaries. His court was noted for its luxury. Many of the beautiful mosques in the Ottoman empire were built by him.

Bajimont, *see* BAGIMONT'S ROLL.

Bajmok, a tn. in the co. of Bács, Hungary, not far from Theresienstadt; pop. (1890) 7151.

Bajus, Michael, or De Bay (1513-89), theologian, *b.* at Melun; studied theology at Louvain, became professor of scriptural interpretation at the university in 1552, and chancellor, 1575. He was deputy to the Council of Trent, 1563. At Louvain he was the leader of the Augustinian anti-scholastic school of theology. Pius II. condemned him in the bull *ex omnibus afflictionibus*, 1567, for his teaching on justification by faith, sufficiency of [illegible] free-will and [illegible] the immacula[illegible] again condemned by Gregory XIII., 1579. His school came into strong conflict with the Jesuits, and later had great influence on Cornelius Jansen and Jansenism (*q.v.*). Collected works pub. 1696. *See* Linsenmann, *M. Baius und die Grundlegung des Jansenismus*, 1867.

Bajza, Joseph (1804-58), Hungarian poet and writer, born at Szücsi; contributed to *Aurora*, and succeeded Kisfaludy as editor, 1830; pub. a translation of foreign plays and a collection of his own lyrics, 1835, which estab. his position as a poet. He became director of the National Theatre at Pest, 1837. His historical writings include *Historical Library*, 1843-5; *Universal History*, 1847; and a translation of Dahlmann's *History of the English Revolution*. In 1848 he was editor of Kossuth's paper, *Kossuth Hirlapja*.

Bakacs, Thomas (1442-1521), Hungarian cardinal and politician. He became bishop of Gyor and Eger, archbishop of Erztegon, and cardinal and titular patriarch of Constantinople, 1510. He directed foreign policy under Michael Corvinus and Ladislaus II.; he failed in his candidature for the papacy in 1513; he declared an unsuccessful crusade against the Turks.

Bakalahari, the name of a tribe of Bechuanas, living in the Kalahari dist. in Southern Africa.

Bakarganj, a dist., Dacca div., Eastern Bengal and Assam, British India; area 4542 sq. m.; prin. tns. Barisal and Pirojpur; chief product, rice. It is situated on the delta of the Ganges and Brahmaputra; it is intersected by rivs., of which the chief are the Meghna, Arial Khan, and Harnighata. The forest tract of the Sundarbans lies along the coast. Pop. 2,291,752.

Bakau, or Bacau, the cap. of the dist. of the same name in Moldavia, Roumania, on the Bistritza, 50 m. W.S.W. of Jassy, and 188 m. N. of Bucharest by rail. It has a gymnasium, paper works, and some trade in agric. products. Pop. (1899) 16,187, of whom 4000 were Jews.

Bakchiserai, or Bakhtchisarai (Persian *bakhtcha*, orchard, garden; and *sarāi*, palace, inn), a tn. of Crimea, Russia, about 20 m. from Simferopol in the valley of Choruk. The ancient

palace of the khans was built by Abdul-Sakhal-Gerai in 1519, and for years remained in a semi-ruined state, but was restored in 1787 by order of Prince Potemkin. The tn. contains one long street of bazaars and booths; there are thirty-six moques, two synagogues, and a Christian church. In one of the synagogues was found a very anct. parchment roll of the Bible which has since been placed in the Imperial Library. Leather articles, [illegible] candles are manu- trade in tobacco a mixed pop. of Tartars, Russians, Greeks, Armenians, and Karaite Jews, which numbered 13,000 in 1897.

Bake, Jan (1787-1864), *b.* at Leyden, was a classical scholar. Professor of Roman and Greek literature for over forty years in his native town.

Bakel, a fortified port and chief tn. of the B. dist., Senegal, Fr. W. Africa. It is situated on the Senegal R., 85 m. below Kayes, and about 550 m. above St. Louis on the coast. It is an important trading centre from the interior.

Baker, Sir Benjamin (1840-1907), an illustrious Eng. civil engineer. He invented the pneumatic shield; designed, in conjunction with Sir John Fowler, the Forth Bridge, and assisted in the construction of the Nile reservoir. He wrote many papers on engineering subjects. Knighted, 1890; K.C.B., 1902.

Baker, David (1575-1641), Eng. Benedictine monk, *b.* in Monmouthshire; studied law but was converted to Catholicism, entered a monastery at Padua and joined the renewed Eng. congregation of Benedictines, 1619. He was spiritual director of an Eng. Benedictine convent at Cambrai, and was on a mission in England when he died. His valuable MS. collection on eccles. history is in Jesus College, Oxford.

Baker, George (1540-1600), a member of the Barber Surgeons' Company, and elected master in 1597. He was attached to the household of the Earl of Oxford, and he wrote sev. works on medical and surgical subjects, which include: *The Newe Jewell of Health*, a translation of Conrad Gesner's *Evonymus*, with a preface. 1576; translations of Guido's *Questions*, 1579; and Vigo's *Chirurgical Works*, 1586; and *Antidotarie of Select Medicine*, 1579.

Baker, Henry (1698-1774), scientist and author, born in London, was at one time a bookseller, but, in 1720, as tutor to a deaf girl, invented a system of teaching the deaf and dumb. He kept his methods secret, and established a profitable private school for deaf mutes. He helped Defoe in the *Universal Spectator*, 1728, and married his youngest daughter, Sophia, 1729. His chief scientific work was concerned with the use of the microscope. He gained the Copley gold medal of the Royal Society for observations on the crystallisation of salts in 1744. He was made a fellow in 1740. He helped in the foundation of the Society of Arts, 1754, and by his will founded the Bakerian Lecture of the Royal Society.

Baker, John Gilbert (*b.* 1834), Eng. botanist, *b.* Guisborough, Yorkshire; became in 1886 first assistant at the herbarium of the Royal Gardens, Kew, and keeper 1890-99. He was Victoria medallist of the Royal Hortic. Soc., 1897, and gold medallist of the Linnæan Soc., 1899. He is F.R.S. and F.L.S. He was associate editor of the *Journal of Botany*, and has pub. many valuable botanical works, of which the most important are: *Synopsis Filicum*, 1883 (begun with Sir W. J. Hooker); *Flora of the Mauritius*, 1877; *Flora of the English Lake District*, 1885; *Handbooks of the Fern Allies*, 1887; *Amaryllidaceæ*, 1888; *Bromelidaceæ*, 1889.

Baker, Sir Richard (1568-1644), author of the once popular *Chronicle of the Kings of England*, which, we learn from Addison's *Spectator* (269, 329) and Fielding's *Joseph Andrews*, was the favourite history of the country squires. He was M.P. for Arundel and E. Grinstead, and knighted 1603. He lost all his property, and was confined in the Fleet Prison 1635, where he wrote his history, and died.

Baker, Sir Samuel White (1821-93), British explorer, was intended for business by his father, a W. India [illegible] Mauritius, and [illegible]e he founded [illegible]e travelled in [illegible] Europe, and in 1861 started on his explorations of the Nile basin which made him famous. He first explored the Atbara and Ea tribs. of the Nile. In 1862 he met Speke and Grant at Gondokoro [illegible] the discovery of [illegible] the main sources [illegible] their information B. discovered Albert Nyanza, 1864, through which he proved the Nile passed, and the Murchison falls of the Victoria Nile, and returned to Khartum, 1865. He was given the gold medal of the Royal Geog. Soc., and was knighted, 1866. In 1870 the Khedive Ismail appointed him governor-general of the Nile equatorial dists. for four years to suppress the slave trade and open up the country for trade. Many difficulties prevented his success, but he laid the founda-

tions for General Gordon, his successor. After his return to England, 1874, he travelled in Cyprus, India, N. America, and Japan. He was throughout his life a mighty gamehunter. His second wife (married 1861), a Hungarian, Florence von Sass, accompanied him on all his travels. His publications include *The Albert Nyanza and the Exploration of the Nile*, 1866; *Nile Tributaries and Abyssinia*, 1867; *Ismailia*, 1874; *Wild Beasts and their Ways*, 1890; and many books of travel.

Baker, Thomas (1656-1740), antiquary, born at Lanchester, Durham; was educated at St. John's, Cambridge, of which he was a fellow. He refused to read James II.'s Declaration of Indulgence; and lost his living in 1690 as a non-juror, and in 1717 his fellowship. He left his MSS. on the history of Cambridge University to the British Museum and the university.

Baker, Sir Thomas Durand (1837-93), a British officer. He obtained a commission as ensign in the 18th Royal Irish foot regiment in 1854. He served in the Crimean War, 1854-56, and was present at the siege of Sebastopol. In 1857 his regiment was ordered to Central India, where he took part in the pursuit of Tantia Topi, 1858. He was appointed quartermaster-general in the Ashanti expedition, 1873-4; assistant-adjutant-general of the headquarters staff in London, 1875; aide-de-camp to Queen Victoria, 1877. During the Russo-Turkish War he took an active part in the operations, being attached to the Russian army; in the following year, 1878, he was sent to India as military secretary to the governor-general, Lord Lytton; he accompanied Sir Frederick (afterwards Earl) Roberts in the advance on Kabul, 1879-80. He was made a temporary lieutenant-general in 1891, and died at Pau.

Baker, Valentine (1827-87), also known as B. Pasha, an Eng. soldier, brother of Sir Samuel White B. Entered the army in 1848; served in the Kaffir War, 1852-3; promoted to colonel of the 10th Hussars, 1860; explored the north-eastern frontier of Persia, 1873; entered the service of the sultan, 1877, and became a major-general in the Turkish army. He took part in the Russo-Turkish War; organised the Egyptian army for the khedive, 1882-7, and was defeated by Osman Digna at El Teb, near Tokar, in 1884. On his return to England he joined the staff of General Wolseley, 1885, but his application to re-enter the British army was refused. Two years later he returned to Egypt and died at Tel-el-Kebir. Author of *Clouds in the East*, 1876, and *The War in Bulgaria*, 2 vols., 1879.

Baker City, the co. seat of B. co., Oregon, on the Powder R., on the Oregon Railroad and Navigation Company's and Sumter Valley Railroads. It is the centre of a gold and silver-mining dist. The chief industries are agriculture, lumbering, and the manuf. of carriages. There are also breweries, brick-yards, and planing mills. Pop. (1900) 6663.

Baker Mount, a volcanic mt., 10,827 ft. in height, belonging to the Cascade Range in Whatcom co. Washington, United States.

Bakersfield, the co. seat of Kern co., California, on the Kern R., and on the Southern Pacific, and the Atchison, Topeka, and Santa Fé Railroads. It is a stock-raising and fruit-growing dist., and there are machinery works, foundries, oil-refineries, planing and flour mills. The chief exports are live-stock, wool, hides, and agric. products. Pop. (1906) (estimated) 6500.

Bakewell, tn., Derbyshire, England, on the R. Wye, 25 m. from Derby. The scenery of the neighbourhood is beautiful; near are Haddon Hall and Chatsworth. There are Saxon remains on Castle Hill; the church of St. Anne is mentioned in Domesday; on its S. side stands an 8th-century carved stone cross. Lead-mining was practised from very early times, and zinc and marble are still worked. The almshouse dates from 1602, the grammar school from 1637. Pop. 2850.

Bakewell, Robert (1725-95), agriculturist, *b.* at Dishley, Leicestershire, England; devoted himself to the breeding of live-stock; his new long-wool 'Leicester' sheep and the 'Dishley long-horn' cattle became famous. His name stands high in the history of British agriculture. *See* Housman, 'R. Bakewell,' *Jour. Royal Agric. Soc.*, 1894.

Bakhmut, tn., gov. of Ekaterinoslav, S. Russia; founded in the 16th century, it is now a centre of iron and steel manuf., and of coal and salt mining. Pop. 30,585.

Bakhtegan, or Niriz, Lake, Fars, Persia, 74 m. long, formed by the drainage of the Kur. Deposits of salt are collected when the lake dries in summer.

Baking is a method of cooking in which food is cooked in a heated oven; the term is also used in connection with the making of pottery (*q.v.*) and bricks (*q.v.*). The chemistry of the process is explained in the article on cookery (*q.v.*).

Baking Powder, a substitute for yeast composed of a mixture of tartaric acid and bicarbonate of soda, a quantity of flour usually being added

to reduce the strength. When the powder comes in contact with water, carbonic acid gas is set free by the decompositic[illegible] evolution of [illegible] is kneaded t[illegible] the porosity which is required to make the bread light.

Bakony Wald, a mt. range in Hungary, N. of Lake Balaton and S.W. of Buda-Pest. It forms the outlying E. portion of the Alps, and is separated from the Carpathian system by the Danube. The N.E. portion is known as the Vertes Mts. and Pelis Mts. (highest point 2476 ft.). Up the S.W. portion, the B. W. proper, the highest peak is Köröshegy, 2320 ft. The forests feed large herds of swine, and were the haunt of the robbers of F[illegible] t[illegible] f[illegible] For European travellers it embraces the large or small gifts necessary in the E. to procure any service, hence equivalent to 'tip.'

Baktchissari, or **Bakhchi-Sarai** (Turk., garden-palace), tn. in gov. of Taurida, Russia, 20 m. by rail from Simferopol, Crimea. The cap. of the Krim Tartar khans from 15th century, it was sacked by the Russians in 1735. The khan's palace, built 1519, was destroyed but has been restored. Near by is Chufut Kaleh, the deserted seat of the Karaite Jews. Industries include leather, cutlery, and agric. machinery. Pop., mostly Tartars, 12,955.

Baku, a government of Transcaucasia, Russia, bounded E. by the Caspian Sea, N. and W. by Daghestan and Elisavetpol, and S. by Persia; area, 15,061 sq. m.; pop. (1904) 1,013,900. The chief tns. are B. (*see* below), Geok-chai, Kuba, Lenkoran, and Shemahka. B. includes the fertile and wooded slopes N. and S. of the Eastern Caucasus, the Kuba plain N. of that range, and the Kura and Aras steppes to the S. The railway lines are run from B. to the Beslan-Vladikavkaz junction *via* Derbent along the Caspian Sea (400 m.), and from B. to Batum *via* Tiflis along the Kura valley (560 m.). The arid Apsheron peninsula is the seat of the great oil-fields, which lie round the tn. of B.; these include Balakhani, Bibi Eybat, the 'Black tn.' and the 'White tn.'

The output, amounting to some 5000 tons only in 1863, yields about 10 million tons annually. In 1904, 9,800,000 tons were produced; the outbreak in 1905 of the racial feuds between Tatars and Armenians and the general civil disorders of the period reduced B. to anarchy and large areas of the oil-fields were burned. A steady recovery has since ensued, and the output has reached a normal level once more (over 8 million tons, [illegible] The refined oil, petroleum, is conveyed by pipe-lines to [illegible] on the Black Sea for export; the heavier crude oil, naphtha, used for fuel and lubricants, is conveyed by tank-cars. The prin. tn., Baku, lies to S. of the Apsheron peninsula, on the Caspian. It is an important harbour for the [illegible] and is the chief naval flotilla. T[illegible] W., the old tn., still retaining its oriental look, is to the E. The tn. is mentioned by Masudi, the Arabian geographer, in the 10th century, and the 11th-century mosque of the Persian shahs still remains. B. belonged to Persia till its capture by the Russians in 1735; it became part of the Russian empire in 1806. The Parsee fire worshippers had a holy shrine and sacred place at Surakhani, 13 m. E. of the tn. Pop. (1904) 177,777. *See* Marvin, *The Region of the Eternal Fire*, 1891, and Henry, *Baku, an Eventful History*, 1906.

Bakunin, Michael (1814–76), anarchist and revolutionary, was born at Tajok, Russia, of a noble family. He resigned his commission in the Imperial Guard, and in 1846 met Proudhon, the founder of anarchism, in Paris. Expelled from France in 1848, he shared in the Dresden revolution and was sentenced to death. The sentence was commuted, and he was later handed over to the Russian authorities and exiled to Siberia, 1855. He escaped in 1861, and spent the rest of his life chiefly in Switzerland. He joined the International in 1869, becoming the leader of the more violent Latin section, styling themselves federalists or anarchists as opposed to the political socialists under Marx. His attacks on his opponents at the Hague Congress of the International, 1872, led to the expulsion of B. and the anarchists. He died in Bern. His best known work is *Dieu et l'Etat*, a portion of his *Fédéralisme, Socialisme et anti-Théologisme*; his complete works were published 1905. *See* his *Life* by M. Nettlau.

Bala, tn., Merionethshire, N. Wales. The prin. industry is stocking and flannel manuf. B. College is the northern theological college of the Calvinistic Methodists. B. Lake (Llyn Tegid), 4 m. long by ¾ wide, is the largest in Wales. Pop. 1554.

B[illegible] O.T [illegible] nise of Heb. race. In other parts of the Bible, *e.g.* 2 Peter ii. 15, Rev. ii. 14, he is reprobated as one of those who

love the 'wages of unrighteousness.' Balak, King of Moab, alarmed at the defeat of the Amorites and Bashan by Moses and the Israelites, sends twice with promises of reward to summon B. from Pethor on the river, *i.e.* Euphrates. Forbidden at first, he is commanded to go, but only to speak the words God shall put into his mouth. On his journey occurs the incident of the angel and the speaking ass (*cf.* the speaking serpent in Gen., the only other example in O.T.). Three times B.'s curses are turned to blessings, at the high places of Baal, on Pisgah and on Peor. These blessings take the form of seven poems: (1) xxiii. 7-10, the power of Israel; (2) and (3) xxiii. 18-24, xxiv. 3-9, the coming monarchy; (4) xxiv. 14-19, the rise of the star and sceptre out of Jacob; (5), (6), and (7) xx.-xxv. the doom of Amalek, conquest of the Kenites by Assyria, the ships from the W., Chittim (?Cyprus), to overthrow Assyria. The last three poems are considered a later addition by modern critics, who trace two distinct versions in the story of Numbers. B. is slain in the punishment inflicted on Moab (Josh. xiii. 22).

Balachong, a Chinese condiment made of putrid shrimps or small fish pounded with spices and salt and then dried and eaten with rice.

Balæna (Lat., whale), the right-whale, is the typical genus of the family Balænidæ and order of mammals known as Cetacea. The name was first applied to the common or Greenland whale, but has been widened in application. It has a large head, no teeth in the adult, a narrow throat, long plates of whalebone attached to the palate, and no dorsal fin. *B. mysticetus* is the Greenland whale; *B. australis* the southern right whale.

Balæniceps (Lat. *balæna*, whale, *caput*, head) is the shoebill, a genus of the family Ardeidæ, which includes herons and bitterns, and it is allied to the storks and flamingos. It lives in the marshes of the Upper Nile and feeds on fish, lizards, and other reptiles. It has a peculiar, large, boat-shaped beak. *B. rex* is the only species known.

Balænoptera (Lat. *balæna*, whale, πτερόν, wing), the name given by De Lacépède to the fin-whales known as rorquals because of their dorsal fin. They are found in all seas and are found in a fossil state. *B. musculus* is the common rorqual; *B. sibbaldi* the blue whale.

Balafré, Le (Fr., the scarred): 1. The name applied to Ludovic Lesly, uncle of Quentin Durward, the hero of one of Scott's novels, because of his scarred cheek. 2. The nickname, given for a similar reason, of Francis, Duke of Guise (1519-63).

Balaghat, a dist. of the Nagpur div. of Central Provs., British India; area 3132 sq. m.; pop. 326,521. The chief tn. is Burha.

Balaguer, Vittorio (1824–1901), Spanish poet, historian, and politician, was *b.* at Barcelona, and *d.* at Madrid. In 1854 he was appointed keeper of the archives at Barcelona, and shortly afterwards professor of history. Among his most important works may be mentioned: *Trovador de Montserrat*, 1850; *Primavera del ultimo trovador catalan*, 1876; *Don Juan de Serralonga*, 5th ed., 1875; *Historia politica y literaria de los trovadores*, 1878.

Balakhissar. *see* BALIKESRI.

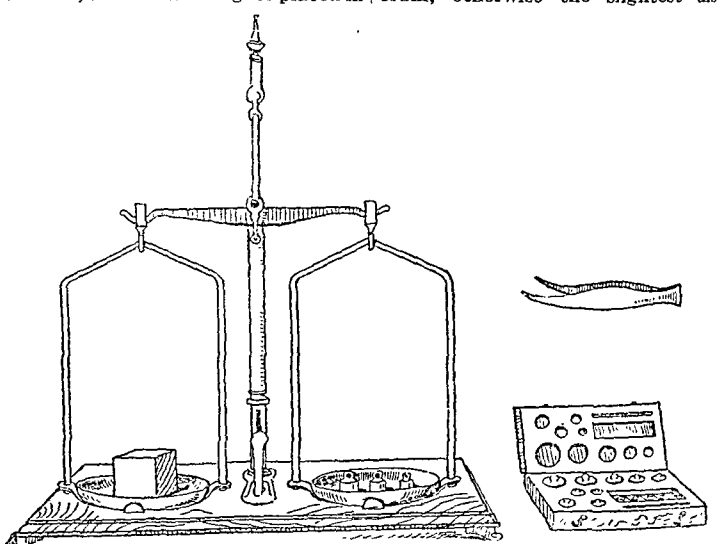
Balakhna or **Balachna**, one of the circles of the prov. of Nizhni Novgorod, Russia, situated principally on the r. b. of the Volga. The land is cultivated and produces crops of flax, hemp, and corn. The chief tn., of the same name, is about 20 m. N.W. of Nizhni-Novgorod, on the r. b. of the Volga, where it is joined by the Uzola. The wooden walls and towers which once surrounded it were destroyed by fire in 1730. There is traffic in grains, linens, and other manufs., and barks are built for the navigation of the Volga. Pop. (1897) 5037.

Balaklava, or **Balaclava**, a tn. in the S.W. of the Crimea, on the Black Sea, about 6 m. from the harbour of Sebastopol. The harbour is excellent, having a narrow entrance, and being sheltered by lofty hills. It is the Portus Symbolorum of the ancients, a port at which Ulysses is said to have touched. An accurate and graphic description of the bay is given by Homer. It was for long a Gk. colony; in the 14th century it fell into the hands of the Genoese, who called it Bella Cala, or Cembalo. (The present name is supposed to be derived from the It. *Bellachiava*, fair haven.) The Genoese settlers were expelled by the Turks in the 15th century. Catherine of Russia made it into a military station. In 1854-6 the town was held by the British. An engagement was fought between the Eng. and the Russians on the heights between B. and Tchernaya, when the famous charge of the Light Brigade (Six Hundred) was made on the Russian guns. Pop. (1897) 1274. *See* Kinglake's *Invasion of the Crimea*, vol. iv., 1863-87; and Paget's *The Light Cavalry Brigade in the Crimea*, 1881.

Balalaika, a musical instrument common in Russia, where it is used by the peasants to accompany popular songs. It has a triangular base, with two or three strings, not unlike a guitar.

Balance (Lat. *bi*, two, *lanx*, a dish), an instrument for determining the weight of a body. The application of the term is extended to any condition of equilibrium, as in B. of power (*q.v.*), and also to the excess of one quantity over another, or the quantity necessary to establish equilibrium, as in B. of trade (*q.v.*), and the credit or debit B. in a book-keeping account.

The common B. consists essentially of a beam resting at its middle point upon a fulcrum and furnished at its extremities with two scale pans; the goods to be weighed are placed in one of these, and known weights placed in the other until the beam assumes a horizontal position. The B. thus constitutes a lever of the first class, the condition of equilibrium being estab. by the force rotating the beam in one direction being counteracted by an exactly equal force tending to rotate the beam in an opposite direction. In order that the B. should give a true result, the following conditions must exist: 1. The two arms of the beam must be precisely equal in length, otherwise a weight depending from the end of the shorter arm will be balanced by a smaller weight on the longer arm, as in the steelyard. A sufficient test is provided by placing weights in the two pans until the beam is horizontal and then interchanging the weights, when the beam should become horizontal again. 2. The B. should be in equilibrium when the scales are empty. This does not necessarily mean that the arms are equal, for unequal arms may be compensated for by pans of unequal weight; this condition would give an incorrect result, a weight in the lighter pan on the longer arm having more additional turning power than an equal weight in the heavier pan on the shorter arm. 3. The centre of gravity of the beam and pans should be in the same vertical line as the fulcrum when the beam is horizontal, and should be a little below the fulcrum, otherwise the slightest displacement would result in the beam toppling right over.



BALANCE

A B. is said to be delicate, sensible, or sensitive when a small additional weight in one pan causes an appreciable rotatory movement of the beam, that is, when the angle moved through by the beam is large for a small difference in the weights at either end. Delicacy may be obtained by attention to the following points: 1. The arms of the B. should be made as long as is consistent with lightness and rigidity, for the longer the arm is, the greater will be the turning power of a small weight. 2. The weight of the beam should be as small as is consistent with rigidity, for the amount of rotation should depend as much as possible on the weight in the pan, or, in other words, the weight in

the pan should be the [illegible] sible proportion of the [illegible] tending to turn the be[illegible] fulcrum. These two conditions are often met by making the beam of aluminium and constructing it so that it is capable of bearing the greatest strain without bending in a vertical direction. 3. The centre of gravity of the beam should be brought a very little below the point of support, so that the weight of the machine should tend as little as possible to keep the beam in a horizontal position. 4. Friction should be reduced to a minimum. To effect this, the edges from which the beam and pans are supported are made as sharp and as hard as possible, and the surfaces on which they rest as smooth and as hard as possible. The edges are therefore often made of agate and the surfaces of polished steel. Additional delicacy is imparted to the machine by the use of a long vertical pointer attached to the middle of the beam, the slightest deflection of which causes a considerable arc to be described by the end of the pointer.

It is sometimes necessary that a balance should be stable, that is, that the beam should return as quickly as possible to the horizontal position after deflection. To effect this, it is necessary that the centre of gravity of the beam and pans should be some distance below the fulcrum, so that when the beam is deflected, and the centre of gravity therefore no longer vertically beneath the fulcrum, the weight of the machine will operate in bringing the B. to rest again. This condition is the reverse of that required for sensibility, so that the properties of stability and sensibility are in some degree incompatible. In commerce, where quickness of weighing is desirable, stability is aimed at; whilst in physical and chemical research, where accuracy is of prime importance, and time merely a secondary consideration, the centre of gravity of the B. is brought very close to the fulcrum. In most of the delicate Bs. used for chemical analysis, the distance of the centre of gravity from the fulcrum can be regulated within small limits by the use of a screw on the beam vertically above the fulcrum, turning the screw so that it rises bringing the centre of gravity nearer the fulcrum, and *vice versâ*. Such Bs. are protected from air currents, dust, etc., by being enclosed in glass cases, with sliding fronts. Strong sulphuric acid, caustic, potash, or some other dehydrating substance is usually exposed in dishes to absorb moisture from the air. The wearing of the parts in a chemical B. is obviated by allowing

[illegible] nd pans to rest on suitable [illegible] hen not in use, the knife- [illegible] brought into contact with their surfaces by moving a screw in front of the instrument. A graduated scale behind the pointer renders it unnecessary to wait for the B. to come to rest at each weighing, as equal deflections either side are quite sufficient to indicate equal weights A small 'rider,' or movable piece of wire can be used to bring the B. into equilibrium when the difference in weights is very small; the rider is moved along the beam towards its extremity over small graduations, the motion over one graduation being generally equivalent to an additional weight of one-hundredth of a grain.

Even if a B. be not accurate in itself, a good result may be obtained by double weighing. The body to be weighed is placed in one pan and shot or sand poured into the other until the beam is horizontal. The body is then taken off and known weights placed in the pan until the beam is again horizontal. The result will be accurate even if one of the pans is loaded. Another method consists of placing the body to be weighed in the two pans successively and obtaining two results. If the fault of the B. is that it has unequal arms, the true weight will be the geometrical mean of the apparent weights, but if the B. is false through the pans being unjustly loaded, the true weight will be the arithmetical mean of the apparent weights.

Roberval's B. consists of four rods hinged smoothly in the form of a parallelogram. In its position at rest the rods form a rectangle, the weight pans being firmly fixed to the vertical rods, and the horizontal rods free to turn about their middle points, which are supported by fixed vertical uprights. Whatever movement takes place, the four movable rods form a parallelogram, t[illegible] weight pans alv[illegible] The vertical wor[illegible] one of the pans [illegible] fore always equal and opposite to the virtual work done in displacing the other, no matter on what parts of the platforms the weights may be placed. This form of B. is commonly used for weighing letters and parcels.

The common or Roman steelyard is a lever of the first class, but equilibrium is obtained by varying the distance of the weight from the fulcrum instead of varying the weight. It consists of a beam movable about a fulcrum near the end, from which is suspended the body to be weighed. A movable weight is slid along the long arm until the beam balances horizontally. Graduations on the

long arm indicate the weight of the body.

The Danish steelyard consists of a bar with a heavy knob at one end and a hook at the other from which the body to be weighed is suspended. In this case the fulcrum is movable, and usually consists of a loop of string, its position with respect to graduations on the bar indicating the weight of the body.

The bent lever B. consists of a lever of unequal arms, the lighter of which ends in a pan to receive letters or small parcels. The other arm is bent downwards and weighted, and moves in front of a graduated arc. The nearer the weighted arm is to the horizontal position the greater is its turning power, as the weight acts at a greater distance from the fulcrum. Therefore the weight of the body placed in the pan is determined by the extent to which it lifts the weighted arm. The instrument is gener[illegible]ly.

Th a steel wire spiral, and cylindrica which the spring is attached to a pointer moving along a vertical scale. The body to be weighed is suspended by a hook, or placed in a pan attached to the bottom of the spring, and the weight is indicated by the amount of stretching that the spring undergoes. The elasticity of the spring varies with time and use, and as it is used directly against the force of gravity, the readings of such an instrument vary in different places on the earth's surface.

The torsion B. consists of a fine wire clamped at one end and carrying an index swinging in a horizontal plane at the other. The angle through which the index is twisted is proportional to the force causing the torsion. The index is usually a magnetic needle, and the instrument is used to measure the force of magnetic attraction and repulsion.

Balance of Power, in diplomacy, the principle of maintaining an equilibrium between states or groups of states so that no single state or group [illegible]ful, or nciple tional recog- ody of ich we they depend ultimately on no power being so powerful as to be able to ignore them with impunity. In diplomatic relations the principle has operated, though not stated in actual words, from the earliest times, *e.g.* in the leagues of the Greek city states: the maze of wars and alliance of the It. republics; or the attempt of Wolsey and Henry VIII. to make England *the balancing power in Europe*. In the 17th and 18th centuries, the B. of P. was recognised as a definite formula of diplomacy. It was the guiding principle of William III. in his life-long struggle against Louis XIV. It explains the tangled diplomacy and constant wars of the 18th century, culminating in the coalition of all the powers against Napoleon. Canning's famous remark, 'I called the New World into existence to redress the balance of the Old,' *in regard to his recognition of* the revolted Spanish colonies in S. America, illustrates the vitality of the theory. Recent years have confirmed its place as a principle of modern European policy; the Triple Alliance has been countered by the Dual Alliance, and by her *entente* with France and the later agreement with Russia, Great Britain left her 'splendid isolation' in order to maintain the equilibrium threatened by the increase of Ger. power and the weakness of Russia. While formerly the principle was confined to European diplomacy, the tendency now is to extend it to world-politics; China and the Middle E. come into its sphere: the rise of Japan makes the B. of P. in the Pacific a vital question for the future of Australia. *See* Hume, *Essay on the Balance of Power;* Vattel, *Le Droit des Gens;* F. von Gents, *Fragments on the Balance of Power;* L. Oppenheim, *Internal Law*, vol. i.; and the *Cambridge Modern History*.

Balance of Trade, The, was a term applied to the balance of the profits of the exports and imports of a country. It was held that the wealth of a country depended on the difference *in gold between its exports and* imports: if there was an excess in the value of exports over the value of the imports, the balance was in favour, if not, the balance was against the country. In consequence, legislation tended to protect the exports and [illegible] now regarded as fallacious. *See* also TRADE.

Balance Spring, *see* HOROLOGY.

Balanda, a tn. of Russia, under the gov. of, and 90 m. N.W. of, Saratov; pop. 7000.

Balanga, the cap. of Bataan, on the is. of Luzon, Philippines, on the W. side of Manila Bay, 34 m. from Manila. There is irrigation from the R. Talisay. Pop. (1903) 7347.

Balaninus, a genus of coleopterous insect of the family Curculionidæ which includes many species of small

size. The members of this genus have a long snout furnished with a pair of horizontal jaws which assist it in placing the eggs in the kernels of fruit. The egg hatches into a larva, when the creature feeds on the host-kernel, bores a hole through it, and assumes the pupa state when it has burrowed into the ground. They are cosmopolitan. *B. nucum*, the nut-weevil, attacks common nuts and filberts; *B. glandium*, the acorn.

Balanoglossus (Gk. *βάλανος*, gland, *γλῶσσα*, tongue), the typical genus of the Balanoglossida of the class Enteropneusta. It has a worm-like, elongated body, breathes by means of gill-slits, and bears in the anterior region a curiously-shaped proboscis which serves as an organ of locomotion. It inhabits the sand of various seas, and about ten species are known.

Balanophoraceæ, an order of parasitic dicotyledons comprising many tropical species. They are leafless, and are found to exist on the roots of trees. The flowers are unisexual and appear above the ground with thin, scaly leaves, the stamens and carpels being borne on separate stems. The chief genus is *Balanophora*, which consists of eleven species growing in India.

Balantia (Gk. *βαλάντιον*, bag or pouch), the generic name given by the Ger. naturalist Illiger to those marsupials commonly called Phalangers.

Balanus (Gk. *βάλανος*, acorn, gland), the scientific name by which is indicated the barnacle (*q.v.*) or acorn-shell (*q.v.*).

Balaoan, or **Baloang**, a tn. in the prov. of La Union, Luzon, Philippines, 22 m. N. of San Fernando; pop. (1903) 10,008.

Balard, Antoine Jérôme (1802-76), Fr. chemist, was born at Montpellier, and died in Paris. He became professor of chemistry in his native tn., and in 1826 he discovered bromine. In 1844 he was elected member of the Academy of Sciences, and in 1851 was appointed professor of chemistry in the College of France. He contributed to the *Annales de physique et de chimie*, and also to the *Mémoires de l'Académie des sciences*.

Balaruc, or **Balaruc-les-Bains**, a vil. near the town of Frontignan, in the dept. of Herault, France, celebrated for its hot sulphur springs, near the border of the Etang de Thau. Opposite the baths, there is an isolated rock, called Rocairals or Roquerol, the base of which is covered with mussels and other shell-fish. Pop. about 2000.

Balashov, a tn. of Russia, in the gov. of, and 125 m. W. of, Saratov, on the l. b. of the Khoper, a trib. of the Don. An agric. dist. Pop. 12,200.

Balasinor, a dist. of India situated in Gujarat, Bombay. Area, 189 sq. m.; pop. 46,000.

Balasore, or **Balasor**: 1. A dist. of Orissa, British India, on the Bay of Bengal. Rice and salt are produced. Area, 2068 sq. m.; pop. *c.* 1,100,000. 2. The cap., B., is on the Burabullung R., 16 m. from its mouth. It was the first English settlement in E. India (1642), and afterwards the seat of factories belonging to the Portuguese, Dutch, and Danes in succession. The Danes sold their interest to the Eng. in 1846. It has dry-docks and a coasting trade. Pop. (1901) 20,880. 3. A peak, 6762 ft. high, in the Western Ghats, Malabar dist., Madras.

Balas Ruby, a term used by lapidaries to designate the rose-red varieties of spinel, which is composed chiefly of magnesia and alumina. It occurs as crystals, softer than those of the oriental ruby, a much more valuable stone. They are found chiefly in India.

Balassa, Count Valentin (1551-94), Hungarian poet, wrote Latin poems and some popular lyrics in his own tongue for which he invented a new metre. He fell at the storming of Gran, fighting against the Turks.

Balassa-Gyarmat, cap. of Nograd, Hungary, 40 m. N.N.E. of Budapest pop. 9000.

Balata, the juice or latex obtained from *Mimusops balata*, the bullet or bully tree, belonging to the same order, Sapotaceæ, as the Malay gutta-percha tree, *Dicopsis*. B. is used as an inferior substitute for caoutchouc and gutta-percha, but the presence of resin in the latex renders it useless for electrical purposes. It is used for belting, on account of its great strength. The B. tree grows in the W. Indies, S. America, and especially in Guiana.

Balaton, a lake in Hungary, S. of the Bakony Wald, 55 m. S.W. of Buda-Pest. The S. shore is bordered by marshy plains and downs. It is the largest lake in Central Europe, 48 m. long and 7½-10 m. broad, area 266 sq. m. Many streams fall into the lake, and the beauty of its scenery, especially near the Tihany peninsula, makes it a popular bathing and fishing resort.

Balausta, a name applied to the fruit of the pomegranate which is often erroneously termed a berry. It is in appearance a golden colour, about the size of an ordinary orange, and the rind is thick, enclosing numerous seeds, each embedded separately in pulp surrounded by a cell-wall. This pulp is in reality the outer layers of the seed-coats, and it is employed largely in the manuf. of cooling drinks.

Balayan, a seaport of the is. of Luzon, Philippines, in the prov. of Batangas. It is situated 30 m. N.W. of Batangas, and at the north-western end of the Bay of B., which is deep, but open to southerly winds. Mt. B. (alt. about 2675 ft.) is 3 m. to the N.E. Pop. (1903) 8493.

Balbastre, Claude Louis (1729-99), Fr. organist, was born at Dijon. He was the friend and pupil of Rameau, and was appointed organist at the church of Saint-Roch in 1756, subsequently to the cathedral of Paris and the king's brother until the Revolution. He had great skill as a performer, but little as a composer.

Balbec, *see* BAALBEK.

Balbi, Adriano (1782-1848), It. geographer and statistician, born at Venice; became professor of geography at Murano on the publication in 1808 of his *Survey of Political Geography*. In 1813 he was appointed to the customs at Venice. He published *Statistical Essay on the Kingdom of Portugal*, 1822. His best known works were the *Atlas Ethnographique du Globe*, 1826, and the *Abrégé de Géographie*, 1832. His son, Eugenio (1812-84), ed. his writings, 1841, and was also an eminent geographer.

Balbi, Gasparo, a 16th-century Venetian merchant and traveller. His voyages in India and the E., *Viaggio nelle Indie Orientali*, 1590, were incorporated in De Bry's *Collectiones Peregrinationum in Indiam Orientalem*, 1594. He visited Goa, Cochia, and Burma; his account of Pegu is especially interesting.

Balbinus, Decimus Cælius Calvinus (A.D. 237-8), Rom. emperor. On the death of the two Gordiani in Africa, B. and Maximus (Clodius Pupienus) were chosen joint emperors to continue the opposition to the usurping Emperor Maximinus, then with the army in Pannonia. Their powers were equal, and each bore the titles of pontifex maximus and princeps senatus. Maximinus invaded Italy, but was assassinated by his soldiers at Aquileia. On the approaching departure of Maximus against the Persians and of B. against the Goths, the Prætorian guard, adherents of the dead Maximinus, put the two emperors to death. B. had gained some reputation as a poet and orator, and both he and his colleague were of the highest rank and character in the senate. *See* Gibbon, *Decline and Fall of Roman Empire*, c. vii., and app. 12 in Bury's edition.

Balbis, Giovanni Battista (1765-1831), an It. botanist. In 1798, after the conquest of Piedmont, he became a member of the provisional gov., and was also appointed director of the Botanical Gardens at Turin, and in 1819 of those at Lyons. Of his works the chief are *Flora Taurinensis*, 1806; and *Flore Lyonnaise*, 1827-28.

Balbo, Count Cesare (1789–1853), an It. statesman and man of letters, was born at Turin. Napoleon Bonaparte created him auditor to the Council of State at the early age of eighteen by reason of his great business capacity, and when the peace of Vienna gave the provs. of Illyria to France in 1812 he was appointed to the commission which managed the affairs of that country. He vacated his appointment on the fall of Napoleon, and busied himself with literary pursuits, his *Speranze Italia* (Italy's Hope) [illegible] international [illegible] greatly hampered the Republican party under Mazzini.

Balboa, Vasco Nunez de (1475-1517), a Portuguese discoverer and adventurer who settled a colony at Santa Maria in the Gulf of Darien in 1513. He subsequently marched across the Isthmus of Darien and discovered the Pacific Ocean. He was superseded in his command, but at length was appointed lieutenant-governor of the countries on the Pacific coast, and married the daughter of Pedrarias, his successor at Darien. But he was accused of disloyalty, and put to death by Pedrarias.

Balbriggan, a seaport tn. in co. Dublin, Ireland, 22 m. N.E. of the cap. It is famous for its hosiery and woollen manufactured articles, and there is a thriving linen trade; pop. (1901) 2236.

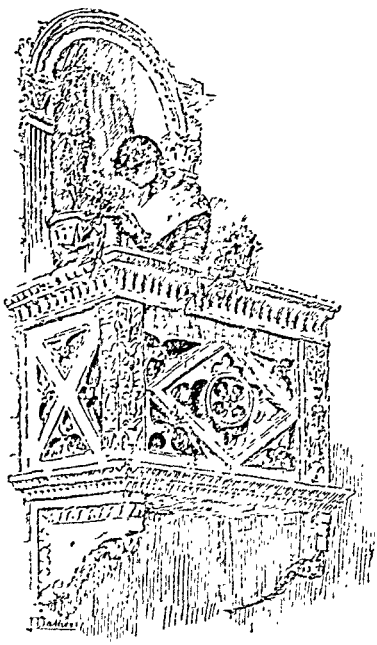
Balbus, Lucius Cornelius, a native of Gades (Cadiz), in Spain. He served under Pompey in the war against Sertorious, for which he received the Roman citizenship. He was prosecuted on a charge of illegal assumption of the citizenship, and was defended by Cicero and acquitted. He looked after Cæsar's property during the Gallic campaigns. In 40 B.C., under Octavius (afterwards the Emperor Augustus), he was made a consul.

Balcarres, *see* LINDSAY; CRAWFORD; and CAMPBELL, ANNA MACKENZIE.

Balchen, Sir John (1670-1744), a naval officer. He first served in the W. Indies, then in the N. Sea, 1703-5, and on the coast of Guinea 1705. While in the Channel he was twice captured by the Fr.—when he was in command of the *Chester*, 1707, and when in command of the *Gloucester*, 1709. He again served in the W Indies, 1715-16, and in the Baltic, 1719-27. In 1728 he was appointed rear-admiral, in 1734 vice-admiral, in 1743 admiral, and in 1744 governor of

Greenwich Hospital. He was lost with his ship off Alderney, Oct. 1744.

Balcony, a railed gallery in front of a window. That it was not always placed before a casement is proved by its origin, as it was built out from the sides of fortified places to enable the defenders to throw stones and boiling liquid on the besiegers. Its introduction in dwelling-houses dates from the early part of the 15th century.



BALCONY AT VENICE

It, in origin, it soon became popular in Spain and the Mediterranean countries, and figures prominently in the history, drama, and romance of the southern peoples.

Baldachin: 1. A canopy which is erected over an eccles. altar. It is essentially an ornate structure, and is generally made of marble or silver. Examples are to be seen in almost any continental cathedral of note. In ancient times it was known as the ciborium, from the circumstance that the consecrated bread was kept beneath it. 2. In its domestic sense the term is employed to distinguish any prominence over doorways, windows, or even old canopied beds. The term has also been used to describe the canopy held over an eastern potentate to shield him from the sun.

Bald Buzzard, Fishhawk, and Fishing-eagle are various names given to the *Pandion haliætus*, or osprey (*q.v.*).

Balder, the Norse god of light, son of Odin and Frigg, and husband of Nanna. He may be described as the Scandinavian Apollo. The gods were aware that if evil happened to him it would be the signal for their overthrow, and therefore Frigg laid every object quick and dead under an obligation to refrain from offering him hurt. Loki, the god of evil, however, discovered that this oath had not been administered to the mistletoe plant, which was considered to be too young and weak to hurt any one, and, profiting from the omission, he threw a sprig of it at B., who fell down dead. Hel, goddess of the dead, offered to restore him to animation provided all things wept for him. But Loki refused to do so, and B. was lost. The B. myth is considered by some authorities to be a remnant of tree-worship, whilst others see in it a myth of ritual origin, but it seems pretty obviously a sun-myth, the slaughter of the luminary by the malevolent powers of winter. Again the mistletoe alluded to may not have been intended to describe the plant, but a magic sword, *Mistelteinn*, the origin of the name of which is totally different from that of the creeper, which is unknown in Iceland, whence the oldest known form of the myth comes.

Baldi, Antonio (*b.* 1692), an Italian painter and engraver. He studied painting under Solimena, and en-

[illegible]

of Don Carlos—and of engravings of his own design.

Baldi, Bernardino, was *b.* at Urbino in 1553, of a noble family. He wrote a vast number of works in prose and verse, the greater part of which have remained unedited. Among those pub. are a poem on navigation, and sev. eclogues, which are not without merit. Of his prose works there are sev. 'Dialogues.' He also compiled a short chronicle of all the mathematicians known from Euphorbius down to his own time; and he pub. two Latin works on Vitruvius.

Baldi, Lazzaro (1623 or 1624-1703), a Florentine painter and engraver. He studied under Cortona at Rome, and became a clever imitator of that master. His works include: at Rome, 'Annunciation' in the Church of Saint Marcel; 'The Virgin, St. Catherine, and St. Bridget' in the Church of Santa Maria della Pace; and at Florence, 'St. John, the Evangelist' in the basilic of Saint-Jean de Latran. Of his water-colours, a 'Circumcision'

is the best known. In 1681 the *Compendio della vita di D. Lazzaro monaco e pittore* was published at Rome.

Baldini, Baccio, one of the first Italian engravers, whose works on that account have an historical interest, but are otherwise on a very low scale of merit. He appears to have been active from about 1460, and after 1481; he was bred a goldsmith, and was taught engraving by Finiguerra himself, who was the inventor of the art according to the Italians. Baldini, however, though acquainted with the art, was incapable of making an original design; he communicated it therefore to Alessandro Botticelli, and the two entered into partnership; the one designed and the other engraved. Such is the story of Vasari.

Baldinucci, Filippo (c.1624-c.1696), an Italian author. He devoted his time to the study of the history of art, and pub. a work on the history of the painters from Cimabue (1260) to 1670 (1681-88, 1767-74); and a history of the most celebrated engravers and their work (1686). A new ed. of his works was published at Milan, 1808.

Baldissera, Alessandro (*b.* 1838), an Italian general. He at first served in the Austrian army; but in 1866 entered the Italian, and in 1888 was appointed commander of the Italian forces in Eritrea. In 1889 he occupied Keren and Asmara, but was recalled in 1889. After the disaster of Adua he was again sent out to Africa, where he replaced General Baratieri, Feb. 1896, and entered upon negotiations for peace, which was declared 1897. He was then engaged in the evacuation of Kassala.

Baldivia, *see* VALDIVIA.

Baldmoney, or *Neum athamanticum*, is the single species of the genus *Meum*, which belongs to the Umbelliferæ. It is an aromatic plant with pale yellow flowers, and is a native of Europe, rarely found in England.

Baldness, absence of hair upon the scalp, which may be a sign of old age or may be congenital. Senile baldness (*calvities* or *calvitium*) is much more common in men than in women. Until the prime of life is passed, new hairs grow to replace the dead ones that fall out daily; it is not till failure in the nutrition of the scalp occurs that baldness begins. Congenital baldness (*hypotrichosis congenita*) usually gives place in time and with treatment to a natural growth of hair, but may last through life.

Baldness that is not senile or congenital is generally due to ill-health, though in some families it is hereditary. Presenile baldness, or premature alopecia in men is frequently due to wearing tight leather bands inside the hat and closely fitting waterproof and cloth caps. It may also be due to seborrhœic eczema, the chief characteristic of which is extreme scurfiness of the scalp. Nervous complaints, anæmia, child-bearing, and favus are all said to be causes of baldness. *Alopecia areata* (baldness in patches) often attacks young persons, and is liable to be mistaken for ring-worm.

[illegible], such as lectricity, air. Salt and ointment of mercury are applied to check baldness, but attention to the general health and occasional use of iron tonics are of the greatest service.

Baldrey, Joshua Kirby (1754-1828), engraver and draughtsman, was *b.* in England, and carried on his life-work between Cambridge and London. His works consisted of portraits after Reynolds, which were exhibited in the Academy in 1793 and 1794; religious subjects as 'The Finding of Moses' (1785), after Salvator Rosa; classical subjects as 'Diana,' after Carlo Maratti; but his *chef-d'œuvre* is the E. window of King's College Chapel, Cambridge. In 1818 he pub. a work on the windows of that chapel.

Baldrick (Fr. *baudrier*, a belt), a broad belt, often of ornate design, worn in the middle ages across the body from shoulder to waist diagonally, which was used for supporting a quiver, bugle, or even a sword. It was generally affected by those of lower rank.

Balducci, Francesco, an Italian poet, was born at Palermo towards the end of the 16th century, and died at Rome in 1643. His work entitled *Rimes* estab. his reputation as one of the greatest anacreontic poets of Italy, and he also wrote *Canzoni siciliane*.

Baldung, Hans (c.1470-1545), called also Hans Grün, a celebrated old Ger. painter and wood-engraver, the contemporary and the friend of Albert Dürer. He was born at Gmünd, in Swabia, but lived chiefly in Switzerland, at Strassburg and its neighbourhood. His woodcuts are variously signed H.B., H.B.G., and H.G. As a painter he was little inferior to Albert Dürer in expression, in colouring, or in finish.

Baldwin, the name of several cities, townships, and post-villages of N. America. It is also the name of a co. of Alabama, which is bounded on the S. by the Gulf of Mexico and has Daphne for its cap. Pop. 14,000.

Baldwin (*d.* 1190), Archbishop of Canterbury during the reigns of Henry II. and Richard I. Having entered holy orders, he was made archdeacon of Exeter, but the secular duties of that office were distasteful

to him, and he became a monk in the Cistercian abbey of Ford, Devonshire, of which he was elected abbot within a year. In 1180 he was promoted to the bishopric of Worcester. In 1184 Henry II. removed him to the see of Canterbury, in spite of the opposition of the monks. In 1186 B. seized certain offerings paid to the convent in order to build a church and monastery for secular priests at Hakington; but the monks appealed to Rome, and he [illegible] In 1189 he [illegible] t Westminster council when his natural brother Geoffrey was promoted from the see of Lincoln to that of York. B. successfully asserted the pre-eminence of the see of Canterbury, forbidding the bishops of England to receive consecration from any other than the archbishop of Canterbury. Having made a visitation in Wales, preaching the crusade, B. took the cross and followed Richard to the Holy Land in the company of Hubert, bishop of Salisbury, and Ranulf Glanville (1190). He died at Acre in the same year. B. wrote *De Sacramento Altaris* and other treatises of the same nature. His works are contained in the *Bibliotheca Patrum Cisterciensium*, 1662. Consult Hook's *Archbishops of Canterbury*, vol. ii.

Baldwin (*d.* 1098), an abbot and physician. He became monk of St. Denys; prior of Liberau, Alsace; abbot of St. Edmunds; and physician to Edward the Confessor and to William the Conqueror.

Baldwin, the name given to the counts of the House of Flanders. The countship was founded by Baldwin I., Bras de fer ('Iron Arm'). He married Judith, the daughter of Charles the Bald, without her father's knowledge, which brought about war between Flanders and Aquitaine. He died in 879 at Arras.

Baldwin II., his son, married Alfrith, the daughter of King Alfred of England. He died in 919.

Baldwin III., 'of the handsome beard' (*d.* 1034), enlarged his territories by seizing Valenciennes, the Is. of Walcheren, and other parts of Zealand.

Baldwin IV., 'le Debonnaire,' was guardian to Philip, the young King of France, during his minority, 1060-7. B. married his daughter Matilda to *William of Normandy*, whom he accompanied to England on the Conquest. He died in 1067 and was buried at Lisle. Five other Bs. succeeded to the countship, the most important being Baldwin IX., who became first Latin Emperor of Constantinople.

Baldwin I. (1171-1206), first Latin Emperor of Constantinople, was *b.* at Valenciennes. He joined the fourth crusade in 1200 as Count of Hainault and Flanders, and took part in the capture of Constantinople on behalf of Alexius, son of Isaac II., Emperor of Constantinople, against his uncle, the usurper, Alexius Angelus. Alexius was unable to keep his promises with regard to payment, and in consequence was murdered and Constantinople was sacked. B. was chosen emperor and crowned in 1204. The Greeks, with the aid of the Bulgarians, massacred the Latins in Thrace; B. laid siege to Adrianople, but was defeated and taken prisoner by John, King of Bulgaria, 1205, and died in captivity, 1206. Consult Gibbon's *Decline and Fall of the Roman Empire*, vol. vi. (new edition, 1898).

Baldwin II. (1217-73), the son of Peter II. (de Courtenay) and nephew of B. I., succeeded as Emperor of Constantinople in 1228, but was not crowned till 1239, John of Brienne, his father-in-law, acting as regent during his minority. In 1261 he was driven out of his capital by Michael Palæologus, ruler of Nicæa, and took refuge in Italy. Consult Gibbon's *Decline and Fall of the Roman Empire*, vol. vi. (new edition, 1898).

Baldwin I. (1058-1118), King of Jerusalem, was the son of Eustace, Count of Bouillon, and of Ida of Lorraine. He accompanied his two elder brothers, Godfrey and Eustace, to the first crusade in 1096, and took Tarsus in Cilicia. He there quarrelled with Tancred, the Norman, about precedence, and retired to Edessa, where he was proclaimed lord and assumed the title of Count of Edessa. On the death of Godfrey, 1100, he was called to succeed him in Jerusalem. He became protector of the Holy Sepulchre, and assumed the regal title, which his brother had refused, and was crowned on Christmas Day, 1100. He carried on continual warfare against the Turks; he conquered Cæsarea, Ashdod, and Jaffa, 1101, Tripoli, 1103, Acre, 1103, Sidon, 1111, and Ascalon finally surrendered in 1112. *See* Tasso's *Jerusalem* (canto i.) for a portrait of B. and his brother Godfrey.

Fulcher, B.'s chaplain, is the chief authority for the events of his life in *Historia Hierosolymitana*. Consult Wolff's monograph, *König Baldwin I. von Jerusalem*, and Röhricht's *Geschichte des Königreichs Jerusalem*, Innsbruck, 1898.

Baldwin II., du Bourg, Count of Edessa, succeeded his cousin B. I. as King of Jerusalem, where he reigned from 1118-31. During his reign Tyre was taken, and the military and religious order of the Templars was instituted for the defence of the Holy

Land. He abdicated the crown in favour of his son-in-law, Foulques of Anjou, in 1131, and retired to the monastery of the Holy Sepulchre. Consult Röhricht's *Geschichte des Königreichs Jerusalem*, Innsbruck, 1898.

Baldwin III. (1129-62), succeeded his father, Foulques of Anjou, King of Jerusalem, in 1143. Under his reign the Christians lost Edessa, which was taken by storm in 1145 by Zenghi, Turkish prince of Aleppo and father of the famous Noureddin. B. had to struggle during the greater part of his reign with the power and abilities of Noureddin. Louis VII. of France and Conrad III., Emperor of Germany, joined B.'s forces in an attempt upon Damascus, in which they failed. After his death the Christian kings soon began to lose their power in the E. He was succeeded by his brother Amalric or Amaury, who died in 1173.

Baldwin IV., the Leper, son of Amalric, reigned as King of Jerusalem from 1173-84, when he resigned in favour of B. V., son of his sister Sybilla, and a child of six years old. He died a few months after his uncle in 1186.

Baldwin, Evelyn Briggs (*b.* 1862), an American arctic explorer, born at Springfield, Missouri. He accompanied Peary on the N. Greenland expedition as [illegible] and acted in second in com[illegible] man's polar expedition to Franz-Josef Land, 1908-9. He discovered and explored Graham Bell Land, 1899, and organised the Baldwin-Ziegler polar expedition, 1901-2. He has pub. sev. meterological reports, has contributed articles on arctic life to periodicals, and is the author of *Search for the North Pole.*

Baldwin, George (*d.* 1818), a mystical writer and traveller. He became consul-general in Egypt, 1786-98, and commander in the Malta campaign, 1801. He was the author of several political works, as well as those on magnetic cures.

Baldwin, James Mark (*b.* 1861), an [illegible] at Colum[illegible] t v i University, 1885-87; professor of philosophy at Lake Forest University, Illinois, 1887-90, and at Toronto University, Canada, 1890-93; Stuart professor of psychology in Princeton University, 1893-1903. In 1903 he was appointed to the chair of philosophy and psychology at John Hopkins University. In 1897 he was awarded the gold medal of the Royal Academy of Science of Denmark. He has written most extensively, the chief of his publications being *Handbook of Psychology*, 2 vols., 1888; *Social and Ethical Interpretations*, 4th ed., 1907; *Mental Development of the Child and the Race*, 3rd ed., 1907; *Darwin and the Humanities*, 1909; *The Individual and Society*, 1910. He has also ed. the *Psychological Review*, 1894-1909, and the *Dictionary of Philosophy and Psychology*, 1901-6.

Baldwin, John (*d.* 1545), was judge at the trials of Bishop Fisher, Sir Thomas More, Anne Boleyn, and Lord Darcy. He was M.P. for Hindon, Wiltshire, 1529-36; attorney-general for Wales and the marches, 1530-32; serjeant-at-law, 1531; and chief justice of common pleas, 1535.

Baldwin, Robert (1804–58), a Canadian statesman. He was called to the Bar, 1825; became a member of the executive council of Upper Canada, 1836; solicitor-general, 1840; member of the united legislative assembly, 1841; attorney-general, 1842-43 and 1848-51. During his term of office he introduced several reforms.

Baldwin, William (*fl.* 1547), wrote poetical and other works, and also acted as a [illegible] and school-master. He [illegible] formances fo[illegible] VI. and Mary [illegible] *Magistrates*, 1559.

Bâle, *see* BASEL.

Bale, John (1495–1563), Bishop of Ossory, Ireland, was born at Cove in Suffolk, and entered Jesus College, [illegible] In 1580 he became [illegible] vich. the be- de- VI. but on the accession of Mary he was forced to make his escape, first to Holland and then to Switzerland. On his return to England he was made a prebendary of Canterbury by Queen Elizabeth. He died at Canterbury, and was buried in the cathedral. His fame rests on his contributions to early English drama, notably *Kinge Johan*, which is a link between the morality plays and Elizabethan historical drama. A reprint was made by the Camden Society, 1838. He also wrote the first literary history of England in Lat., 1548, and one or two autobiographical pieces. His select works were published by the Parker Society, 1849.

Balearic Crane, *see* HERONS.

Balearic Isles, a group of is. lying off the E. coast of Spain in the Mediterranean, the prin. of which are Majorca, Minorca, Iviza, Cabrera, and

Formentera. They comprise a prov. of Spain, and have an area of 1860 sq. m., with a pop. of about 320,000. The cap. is Palma, around which the olive is successfully cultivated, its growth forming one of the staple industries of the is. About an equal number of the inhabitants are engaged in the anchovy and sardine fisheries. In the 2nd century B.C. the islands were annexed by Rome, whose armies they joined in large numbers as slingers, in which method of warfare they were especially skilful. It is not, however, necessary to believe that the name of the is. is derived from the Gk. *βάλλειν*, to throw. In the first quarter of the 5th century the group was overrun by the Vandals, and subsequently passed under Arab dominion in the 8th century. It became a prov. of Aragon in 1343. The is. now attract many tourists, and a railway runs from Alcludia, a seaport town, by way of Inca to the cap., where good and cheap hotel accommodation is to be found.

Balechou, Jean Jacques (1715-64), a French engraver. His works are still much valued and eagerly sought for by collectors. T
nation of B.'s st
be found in the prints of Wooliett.

Baleen, a name for whalebone when it is in its original state. *See* WHALE.

Balen, Hendrik van (1560-1632), a Flemish historical painter, and the first master of Vandyck and Snyders, was born at Antwerp. He went early to Rome to study his profession, having acquired the rudiments from Adam van Oort. He was an excellent colourist, a good draughtsman, and painted with great facility.

Balestra, Antonio, a painter, born at Verona in 1666. He was brought up as a merchant, but before his twenty-first year he was studying painting under Bellucci at Venice. He afterwards studied under Maratta at Rome, and he eventually painted much more in the style of the Roman than of the Venetian; he, however, combined the chief beauties of Venetian colour with the characteristic correctness and solidity of design of the Roman school, and is regarded as one of the most able painters of his time. He died in 1734, according to Guarienti, but in 1740, according to Zanetti and Oretti.

Baletti, Rosina (*b.*1768), It. operatic singer, born at Stuttgart and named Elena Riccoboni B. She made her début in Paris at the age of twenty, and was shortly after engaged in a Parisian theatre, where she obtained a brilliant success. She was noted for her sweet voice, sympathetic expression, and perfect vocalisation. Towards 1792 she returned to Stuttgart and became singer in the court of the Duke of Würtemberg.

Balfe, Michael William (1808–70), one of the most celebrated of British musicians and composers, was born in Dublin, and early showed great talent, acting as conductor of the Drury Lane orchestra in 1824 when only sixteen. After an It. training he settled down to the task of composing operas, and produced his famous *Bohemian Girl*, which at once brought him prominently before the public, and by reason of its grace and the popular nature of its melodies has ever since retained a large measure of public favour. In 1845 he was appointed conductor of the It. Opera, Covent Garden, and in 1857 produced *The Rose of Castile*. Later he staged *Satanella*, *Blanche de Nevers*, *The Puritan's Daughter*, and *The Sleeping Queen*, none of which, however, achieved such success as his first production. He may be classed as of the school of such composers as Rossini and Auber.

Balfour, Alexander Hugh Bruce, Lord Balfour of Burleigh, was born in 1849, educated at Loretto, Eton, and Oriel College, Oxford. He took his *B.A. degree with honours in 1871*, and M.A. in 1872. He was created sixth Baron B. of Burleigh in 1869. The title had originally been bestowed upon his ancestor, Sir James B., in 1607, but the fifth baron, having been implicated in the Jacobite rising of 1715, the title was attainted. Lord B. of Burleigh is an honoured and influential Scottish nobleman; his family name is Bruce. He married Lady Katherine Hamilton-Gordon, sister of the seventh Earl of Aberdeen. He is a Conservative, and was Secretary for Scotland, with a seat in the cabinet, from 1895 to 1903, and has been Lord-Warden of the Stanneries since 1905. He has always taken an active and useful part in political, educational, and social reform movements. He was a member of the Factory Commission, 1874-75; member of the Endowed Institutions of Scotland Commission, 1882-89; chairman of the Educational Endowments Commission, 1882-89; chairman of the Welsh Sunday Closing Commission, 1889; of the Metropolitan Water Supply Commission, 1893-4; of the Rating Commission, 1896; Parliamentary Secretary to the Board of Trade, 1889-92; chairman of the Royal Commission on Food Supply in the Time of War, 1903; and of the Royal Commission on Closer Trade Relations between Canada and the W. Indies, 1909. Some of his addresses have been published, such as *Education of Neglected and Destitute Children*, *Higher Education in Scot-*

land. Lord B. of Burleigh was lord-in-waiting to Queen Victoria, 1888-89; lord rector of Edinburgh University, 1896-99; and of St. Andrews, 1900. He is a large landowner.

Balfour, Rt. Hon. Arthur James, statesman and philosopher. P.C., F.R.S., D.L. of Lothian, M.P. for the City of London since 1906. He was born on July 25, 1848, being the eldest son of James Maitland B. of Whittinghame and the Lady Blanche Gascoigne Cecil, the second daughter of the second Marquis of Salisbury. He is thus descended from one of the most ancient families of Scotland and allied also to one of the greatest political families in England. He was educated at Eton and proceeded from there to Cambridge, where he entered Trinity College and took his master's degree. In 1874 he commenced his long political career by being returned as the member for Hertford in the Conservative interest; this constituency he continued to represent until 1885 when he was returned for E. Manchester. In 1878 he became private secretary to his uncle the Marquis of Salisbury, who, on the resignation of Lord Derby, had become foreign secretary. In his capacity as private secretary Mr. B. accompanied Lords Beaconsfield and Salisbury to the Berlin Congress where he received his first lesson in international politics in the settlement of the affairs of Russia and Turkey. About the same time, however, he pub. his famous philosophic treatise, *The Defence of Philosophic Doubt* (1879). This raised his literary reputation and left no doubt but that if he cared to devote himself to literature he would soon establish a considerable reputation. During the years which followed he devoted himself equally to politics and study. In 1880 on the accession to power of the Liberal government he was released from his secretarial duties and became a member of the fourth party. This fourth party was made up of Lord Randolph Churchill, Sir Henry Drummond Wolff, and Sir John Gorst, together with Mr. B. The other three members of this party were very much more active than himself, and he was always regarded more or less as the 'odd man' of the party. In fact during the first half of this decade B. was regarded as the scion of a noble house who played with politics because it was the tradition of his house to do so. Many considered that his health was too uncertain to admit of his taking an active part in politics, and his dilettantism and languor simply added to the belief that he would not seriously adopt politics as a career. On the occasions on which he spoke his speeches were noted not for their oratory or eloquence but for their academic qualities. His strength of character was considerably underestimated, and this taken in conjunction with his ill health only served to strengthen the idea that his political career would be short. With the beginning of Lord Salisbury's first administration Mr. B.'s active official career began. As he himself pointed out on the occasion of his resignation in 1911, he began then a career which lasted for twenty-six years, twenty of which were actually spent in office under the crown. In 1885 he became president of the Local Government Board, but this office he did not hold long, as the first Salisbury administration came to an end at the beginning of 1886. The second Salisbury administration formed in the July of 1886 saw Mr. B.'s appointment to the chief secretaryship of Scotland and a seat in the cabinet. In the early part of 1887 one of those accidents of politics raised Mr. B. to a position in which he astonished his critics and gained for himself a great and lasting reputation as a man of character and a firm statesman. In that year Sir Michael Hicks Beach (later Viscount St. Aldwyn) resigned the chief secretaryship of Ireland owing to an affection of the eyes. The political world was astonished by the appointment to the vacant position of Salisbury's nephew, Mr. B. The opposition jeered at the appointment of a man whom they regarded as a *flâneur* and not as a seriously-minded politician. This was Mr. B.'s first great appointment, and by the work which he so ably did there, by the firmness with which he suppressed crime, by the tenacity with which he clung to his policy, he made himself the most prominent of Conservative statesmen, the most loved and respected by his adherents, the most hated but at the same time the most respected by his opponents, the Nationalists. The days of 'Bloody Balfour' have not yet been forgotten nor forgiven.

The criticism which had been [illegible] which followed [illegible] Irish Land [illegible] and severity of which he had not been accounted equal, he checked the varying tendencies in Ireland to disorder. His work covers one of the most exciting periods of Irish history, and in the face of open outrage, in the face of threats and insults, Mr. B. proceeded with his work, which consisted of the pacification and good government of Ireland. How far he was successful is a question which is settled variously

as the bias of varying authorities differs; it only remains to be said that he reduced crime enormously in Ireland, but the criticism that he turned Ireland into an armed camp cannot be altogether denied. The fact remains that by the opinion of friend and foe alike Mr. B. estab. his reputation as a great statesman during this period. That he was helped by events cannot be denied; the Parnell Commission followed by the O'Shea divorce case, which led to the downfall of Parnell and the breaking up of the Irish party, must have aided him considerably. In 1891, on the death of Mr. W. H. Smith, he became the first head of the Treasury and leader of the House of Commons. During his first tenure of this post, he introduced a local government bill for Ireland, which was withdrawn just before the dissolution of 1892, a dissolution which led to the downfall of the Unionist party and the accession to power of the Liberals. On the defeat of the Liberal party in 1895 he again became first lord of the Treasury and leader of the House of Commons in the administration of Lord Salisbury. During the three years in opposition, Mr. B. won for himself added fame by his conduct of the opposition. During the early days of this second period of leadership Mr. B.'s attitude on the education questions called forth criticism not only from the opposition but from his own party as well, and this feeling was added to by his suggested scheme for a Roman Catholic university for Ireland. His conduct of foreign affairs during the absence and illness of the premier, Lord Salisbury, however, added very considerably to his reputation. His negotiations with Russia concerning northern China were brought to a successful close, and by means of a compromise he succeeded in establishing friendly relations with Russia in place of a threatened quarrel. With the remainder of the Conservative cabinet he took full responsibility for the negotiations with the Transvaal, but his conduct of the war, when war did break out, met with very considerable criticism, criticism which led even the suave imperturbable Mr. B. to become heated in debate.

In July 1902 Lord Salisbury resigned and was succeeded as premier by Mr. B. The administration which followed will probably be remembered chiefly by the fiscal questions which came to the front during that period. The Conservative cabinet, surprised by the sudden proposals of Mr. Chamberlain, divided itself into two camps. Many resignations took place, but Mr. B. retained his position as premier, and declared himself in favour of a retaliatory tariff, thus not advancing at this period the full length that Mr. Chamberlain had, nor allowing himself to be kept in the camp of the free traders. By-election after by-election went against the ministry, and in Nov. 1905 the government resigned, a government being formed by Sir Henry Campbell Bannerman. The election which followed brought about the complete downfall of the Unionist party, Mr. B. himself being defeated in E. Manchester, a seat he had held for twenty years. A safe seat was found for him in the City of London, which constituency he still represents. Up to 1911, Mr. B. led the opposition in the House of Commons; many difficult problems leading to much bitter debating being brought to the front. On the question of the Veto Bill, Mr. B. sided with Lord Lansdowne and found himself opposed by a considerable and influential section of his party. After the Veto Bill had been passed, and just previous to the introduction of the Home Rule Bill, Mr. B. resigned his position as leader of the party. For some considerable time his position had been threatened by his own party, and his leadership was regarded as too pacific. On Nov. 9, 1911, at a meeting of his own constituents, he gave his reasons for resigning. He pleaded his long tenure of office, and said that his health forbade his further continuance in such an arduous post; he, however, did not resign his seat, and has since his resignation been of very great help to his party. His resignation was deplored by all parties. Mr. Asquith in a speech on Lord Mayor's Day, 1911, said that Mr. B. was 'by universal consent the most distinguished member of the greatest deliberative assembly in the world.' By many he is still regarded as the future leader of a Conservative administration. Amongst his varied publications are: *A Defence of Philosophic Doubt*, 1879; *Essays and Addresses*, 1893; *The Foundations of Belief*, 1895; *Economic Notes on Insular Free Trade*, 1903. See *Arthur James Balfour, Philosopher and Thinker*, W. M. Short, 1912.

Balfour, Edward Green (1813-89), surgeon-general and author. He entered the medical dept. of the Indian Army 1834, and became a surgeon 1852. His chief work is the *Encyclopædia of India*, 1857.

Balfour, Francis Maitland (1851-82), an eminent biologist, younger brother of Mr. Arthur B. Born at Edinburgh, he was sent to Harrow, where he displayed great interest in natural science, in which he was

assisted by a friendly master. Passing to Trinity College, Cambridge, in 1870, he was elected natural science scholar in the following year, and obtained the second place in the Natural Science Tripos in 1873. Animal morphology next claimed his attention, and he succeeded in obtaining one of the two seats allocated to Cambridge at the Zoological station at Naples. He had been greatly impressed by the work of Sir Michael Foster in comparative embryology, and in 1880 pub. the first vol. of an extended treatise on that subject, following it with a second in 1881. The first of these vols. dealt exhaustively with the embryology of the invertebrata, the second pursuing the subject as regarded the vertebrata. Mr. B. was resolute in refusing all offers of professoriates from other universities, and continued to reside at Cambridge, which at length recognised his single-mindedness and ability by the institution of a special chair of animal morphology, of which he was appointed first professor. But his health, never robust, was undermined by a bad attack of typhoid fever. On his convalescence he visited Switzerland, and whilst there he essayed the ascent of the Arguille Blanche, Mont Blanc, which at that time had not been attempted. In this effort he lost his life.

Balfour, Gerald William, younger brother of the Rt. Hon. A. J. B., was born in 1853, and is the fourth son of the late J. M. B. He was educated at Eton and Trinity College, Cambridge, where he took a first class in the classical tripos. In 1878 he was appointed assistant tutor and elected fellow. In 1885 he was returned to the House of Commons as member for Central Leeds. In 1891 he was made a member of the Royal Commission on Labour, and became a privy councillor in 1895; Chief Secretary for Ireland, 1895-1900; President of Board of Trade, 1900-5; President of Local Government Board, 1905-6. He was i:
an Irish L
did much
party and which estab. county councils and district councils, one half of the expenditure of those bodies being met from the imperial exchequer. Also introduced the Unemployed Workmen's Act, 1905. Much interested in psychical research.

Balfour, Isaac Bayley (*b.* 1853), a Scottish botanist, born in Edinburgh. He studied at the universities of Edinburgh, Strassburg, and Würzburg; he was regius professor of botany at Glasgow, 1879-84; Sherardian professor of botany at Oxford and fellow of Magdalen College, 1884-88. In 1888 he accepted a similar chair at the University of Edinburgh, and is regius keeper of the Royal Botanic Garden in that city. In 1880 he explored the is. of Socotra, in the Indian Ocean, and in 1888 pub. the results of his travels in the *Transactions*, vol. xxxi., of the Royal Society, Edinburgh. Among his other publications are *Botany of Rodriguez*, 1878, and a translation of Goebel's *Organography of Plants*, 2 vols., 1900-5. He has also edited *The Annals of Botany* since 1887.

Balfour, James (1702–95), of Pilrig, in the shire of Edinburgh, was admitted an advocate of the Scottish Bar in 1730. B. was afterwards appointed sheriff-substitute of the co. of Edinburgh, and, having occupied himself much with philosophical science, he early became an opponent of the celebrated David Hume, whose speculations he attacked in two anonymous treatises, the one entitled a *Delineation of Morality*, the other, *Philosophical Dissertations*. In 1754 he resigned his judicial office, having on the death of Professor Cleghorn, in August of that year, been elected his successor in the chair of moral philosoph
in M
law;
what appear to have been his lectures while in his former situation, under the title of *Philosophical Essays*. In the spring of 1779 he resigned the chair of public law, and retired to Pilrig, where he died.

Balfour, Sir James, of Denmylne and Kinnaird, Bart. (*c.* 1600–57), an eminent antiquary. He early displayed a capacity for poetry, and translated Lat. verse into the Scottish vernacular. He studied heraldry at the College of Heralds in London, and later wrote the *Monasticon Scoticum*, a collection of Scottish ecclesiastical charters. In 1630 he was created Lord Lyon King-at-Arms, and in 1633 was made a baronet. He was deprived by Cromwell of his office, but solaced himself with the collection of heraldic antiquities, and framed valuable abridgements of Scottish charters and chronicles, notably the *Annals and Short Passages of State*.

Balfour, Sir James, of Pittendreich (*d.* 1584), an eminent Scottish lawyer of the 16th century, studied for the church. Implicated in the murder of Cardinal Beaton, in 1547 he was sent with other conspirators to the French galleys, whence he escaped in 1550. Returning to Scotland, his lack of Protestant zeal drew upon him the wrath of Knox. Appointed rector of Flisk in Fife, he was created a lord of session or judge by Queen Mary in 1563. In 1567 he was appointed

governor of Edinburgh Castle, and, having assisted the enemies of the queen, was after her dethronement made president of the Court of Session. He was forced to retire to France because of a charge brought against him of assisting in the murder of Darnley, but later returned. He compiled *Practicks of Scots Law*, a famous handbook of the Scottish legal system.

Balfour, John Hutton (1808-84), an eminent botanist, was *b.* at Edinburgh in 1808, and graduated at the university of his native city. Originally intended for the church, he later abandoned his intention of entering it, and in 1831 took his M.D. degree. In 1841 he was appointed professor of botany in the University of Glasgow, a seat he held until 1845, when he was called to fill a similar position at his *alma mater*. He was also appointed keeper of the Royal Botanic Gardens, where he had been preceded by Hope, Roxburgh, and Buchanan. This dept. of his work was so assiduously fostered by him that the botanical effort displayed in the outlay and scientific arrangement of these gardens brought him widespread recognition from botanists all over the world. He was dean of the Faculty of Medicine in [illegible] years, ultimately [illegible] rious appoint- [illegible] was created an [illegible] universities of Edinburgh, Glasgow, and St. Andrews. He died at Edinburgh.

Balfour, Lord, of Burleigh, a Scottish peer, *d.* 1688. The only remarkable circumstance concerning him is that he was mistaken by Sir Walter Scott for Balfour of Burley, and as such introduced into the novel of *Old Mortality*.

Balfrush, or Barfrush, a tn. in the Persian prov. of Mazanderan, situated on the R. Bhawal, some 12 m. from the Caspian Sea. The riv. is not navigable, and it is necessary to land all merchandise and other goods at the port of Meshed-i-ser on the Caspian. There is a large trade with Russia, and silk and rice are exported. The pop. is variously stated at from 10,000 to 50,000.

Balguy, John (1686–1748), a theologian of repute, was *b.* at Sheffield. He was educated at Cambridge, and in 1718 pub. two pamphlets in defence of Bishop Hoadley. In other works he stoutly defended Dr. Clarke and his views against such antagonists as Tindale and Shaftesbury. He wrote *Essays on Redemption*, which exhibited considerable broadmindedness for his time, and for his services, personal and otherwise, was appointed a prebend of Salisbury in 1727 by Hoadley. He died at Harrogate.

Balguy, Thomas (1716-85), divine, educated at Ripon Free School and St. John's College, Cambridge, where he held the Platt Fellowship, 1741-48, and was assistant-tutor to Dr. Powell, lecturing on moral philosophy for sixteen years. Among the various positions he held at different times were those of public orator, tutor to the Duke of Northumberland, rector of North Stoke, prebendary of Winchester, archdeacon of Salisbury, archdeacon of Winchester, and vicar of Alton. He published many discourses, sermons, essays, and a Life of his father, John Balguy.

Bali, or Bally, a tn. on the Hugli. Bengal, 4 m. N. of Howrah; pop. about 17,000.

Bali, Bally, or Little Java, an is. of the Malay Archipelago, lying E. of Java, from which it is separated by the Bali Strait, and W. of Lombok. Area about 2100 sq. m. The pop. is estimated at 700,000. There are volcanic mts., the highest being Gunong Agung, 10,400 ft. The country is split up into seven dists.: (1) Buleleng and Jemhana on Dutch ter.; (2) Badung, Mengui, Tabanan, Bangli, and Klung Lung, which are autonomous states. The Dutch rule was estab. in 1849, and the Residency of Bali and Lombok is at Buleleng, in the N. The products of the soil are rice, cotton, tobacco, sugar, coffee, and indigo. Fine sculpture and metal work is executed, and the women take a share in the trade and industries. The religion of the people of Bali and the neighbouring is. Lombok is Brahminism, in a form even older than that now found in India. There is a written language called Ballinese. Consult Van Vlijmen's *Bali*, Amsterdam, 1875, and *Scot. Geog. Mag.* 1900, pp. 44-46.

Balihri, a tn. in the Jabalpur dist. of the Central Provinces of India. In former times it was a city of much prosperity. It contains many temples. Pop. about 3000.

Balikesri, or Balakhissar, or Balikshehr, cap. of the Karasi sanjak of the vilayet of Brusa, Asia Minor. It is situated on a fertile plain, 575 ft. high. The chief products are opium, silk, and cereals. A large fair is held on Aug. 15. Pop. about 20,000.

Balin and Balan, two brothers in the Arthurian legend. They met on their wanderings, and failing to recognise each other, fought, and both were slain. Consult Malory, *Morte d'Arthur* (Globe edition, 1868). There is also an early poem called *Balan*, belonging to the Charlemagne cycle, the English version of which is *The Sowdan of Babylon*.

Balinag, a tn. of Luzon, Philippine Is. It is in a fertile dist., and manufs. silk and cotton. Pop. 16,000.

at all, and this was due to a very great extent to the aloofness of the conquerors, to their religion, and to the obvious contempt with which they treated the subject races. In the third decade of the 19th century the war of Gk. independence began, an independence which was recognised by the Turks in 1829, and in 1830 the independence of Servia as a tribute-paying principality was also recognised. Practically no changes took place until the treaty of San Stefano in 1878, which lowered very considerably the power and prestige of the Turks in Europe, and created a large Bulgarian principality which threatened the power of Turkey still more. The treaty of Berlin which followed cut down the greater part of this Bulgaria, made it less threatening, and also at the same time created the final independence of Servia, Roumania, and Montenegro, and handed over Bosnia and Herzegovina to Austrian administration, by whom they were seized in 1910. In 1897 Crete was withdrawn from the administration of Turkey, and the Greco-Turkish War which followed in the same year was won by Turkey, who received a few places of strategical importance on the frontiers of Thessaly. In 1908 a revolution of the Young Turks drove Abdul the Damned from the throne of Turkey, and estab. a constitutional gov. under his brother. In 1911 war broke out between Turkey and Italy over the vexed question of Tripoli, and at the present time the Young Turk party seem to be on the verge of extinction.

Balkan War, The. This war, waged in the autumn of 1912 and the first European war of the 20th century, was one of the shortest, most sanguinary, and, in the truest sense of that much abused term, the most epoch-making war of modern times. The epoch of European history brought to a close by this war, was that which opened in 1453 with the fall of Constantinople, capital of the Byzantine empire, which, together with the whole Balkan Peninsula, was submerged beneath the wave of Turkish invasion from Asia Minor. This wave spent itself when it reached the gates of Vienna, and through the following centuries the tide of Ottoman dominion gradually receded as one by one the subjugated Christian races achieved a partial or complete autonomy. The waning of the Crescent was only stayed by the foolish jealousies of the Great Powers of Europe and, to a certain extent, by the rivalries of the petty Balkan states themselves. The Crimean War (1854-6), between Russia on the one hand and England and France on the other, was undertaken by the latter powers to maintain Turkish rule in Europe, and in 1885 Bulgaria and Servia, for a brief period, were at war with one another because the latter country feared a territorial aggrandisement by Bulgaria in Eastern Rumelia. On all these jealousies the crafty sultan, Abdul-Hamid II., successfully played, and thus for many years secured an immunity, during which he continued to misgovern and oppress his European provinces. He might have continued in this rôle till death had put an end to his schemes, but his misgovernment and despotism were too much for even his Mussulman subjects. He was accordingly deposed in 1909, and a constitutional regime inaugurated, with his long-imprisoned brother, Mohammed V., as sultan.

The hopes raised by the successful revolution of the Young Turks that the Christian population of Turkey in Europe would be better treated proved to be illusory. It is true, so far as the Turks themselves were concerned, that some reforms were effected. It is true also that Jews and Christians were allowed to become officers in the army, but the non-Islamic population (which in Turkey in Europe numbered about three-fifths of the total population) was practically no better off. Again and again did the small states who al[illegible] P [illegible] tl Albania, Macedonia, and Thrace. They appealed to the Great Powers, who formed the so-called 'Concert of Europe,' to fulfil the obligation to which they had solemnly pledged themselves by the Treaty of Berlin in 1878, but the slow-moving mill of international diplomacy ground out no modicum of reform. The much-prated 'Peace with Honour' became a by-word of reproach among the [illegible] peoples. Peace was secured at the price of \t last, despair-ıg done by the states themselves decided to cut with the sword the Gordian Knot. Greece had already, in 1897, fared somewhat badly in a war with Turkey. But what each state was individually too weak to accomplish might be effected by union. Sinking for a while their differences, Bulgaria, Servia, Greece, and Montenegro combined to form the Balkan League, a league having for its object the safeguarding of the common interests of their nationals in the Turkish empire. By this means a striking force was formed of approximately the same strength as the

Ottoman troops, with the added advantage of being able to attack on all sides at once. A suitable opportunity to commence hostilities presented itself towards the end of September 1912. The Ottoman administration was then suffering from the strain of the year old war with Italy (albeit that war was confined to its Tripolitan territory); the rising of the Albanians, restive under the constitutional régime; and the struggle in the government between the reactionists and constitutionalists. On Sept. 30 (a year and a day after Italy had declared war on Turkey) the order was given by Bulgaria and Servia for a general and simultaneous mobilisation. Greece and Montenegro immediately followed suit, and the next day Turkey had perforce to reply by a general mobilisation. The next few days were spent by the startled Powers in the endeavour to find a formula which would preserve an artificial *status quo* in the Balkans. The dusty, inoperative, and almost forgotten clause xxiii. of the Treaty of Berlin—an article by which the Great Powers pledged themselves to compel Turkey to introduce reforms into its European provinces—was hastily taken out of the pigeon-holes of the various chancelleries, but on Oct. 8 the smallest of the allied states, Montenegro, without even an ultimatum, declared war.

From the moment of this apparently calculated indiscretion of King Nicholas it was obvious that it would be only a matter of a few days before Montenegro's allies joined the fray. Events moved very rapidly. On Oct. 10 the Great Powers by their collective note made a last attempt to induce Turkey to grant such reforms as would avert war, and three days later an identical Græco-Serbo-Bulgarian note was presented to the Ottoman government. Turkey's reply to the latter was to declare war on the allies on Oct. 17. In the meantime the Montenegrins, under the command of Generals Vukotitch (commander-in-chief) and Martinovitch, had invaded Albania with two or three columns, captured successively Detchitch, Skiptchanik, Tuzi, and Berane, and had invested Tarabosh and Scutari. Also before Turkey declared war on the allies two other significant events had taken place: the admission of deputies from Crete into the Greek Chamber on Oct. 14, and the conclusion on Oct. 15 of the Peace of Ouchy (or Lausanne) between Turkey and Italy, a peace in which Turkey recognised the *fait accompli* of Italian occupation of Tripoli, and at the same time enabled Turkey to give undivided attention to the war about to commence.

The war was characterised by one or two marked features, perhaps the most outstanding of which was the fact that each of the invading armies by itself and without the aid of its allies overcame Turkish resistance in various parts of the country. Thus the Bulgarians alone, under the supreme command of General Savoff, and with General Dimitrieff as his principal lieutenant, on Oct. 22 to 24 at Kirk Kilisse turned the right flank of the army under Nazim Pasha, the Turkish commander-in-chief, of whose forces Mahmud Mukhtar Pasha and Abdullah Pasha were important leaders. The Turks fled from Kirk Kilisse in great confusion, abandoning in their flight large quantities of stores and guns. The Bulgarian losses alone were estimated at 2000 killed and 5000 wounded. By this turning movement the Turkish forces were divided: some were driven south towards the Ægean Sea; the main body retreated towards Constantinople; while the remainder speedily found themselves invested in Adrianopole. Hotly pursued by the Bulgarians, Nazim nevertheless succeeded in rallying his panic-stricken forces, and a stand was made in an engagement extending over a front of 100 m. In this great battle, known officially as that of Lule-Burgas-Bunarhissar, which was fought on Oct. 28 to 31, success at first seemed to attend the Turkish arms, for the right wing more than held its own, but at length the left wing was smashed in the carnage that raged round Lule-Burgas. This compelled the Turkish right and centre to fall back; the retreat again became a stampede which was only checked at the banks of the Chorlu. Eventually this position was abandoned for the stronger Chatalja lines. The casualties in this engagement reached the enormous total of 55,000, of which 15,000 were in the Bulgarian forces. The captures from the Turks included 75 guns, 2800 prisoners, and much stores and ammunition. The subsequent fighting before the Chatalja line of forts was of a desultory nature, due in part to the exhaustion of the Bulgarians and their desire to avoid the epidemic of cholera which began on Nov. 7, and which severely ravaged the Turkish forces, about 1000 fresh cases occurring each day.

Meanwhile the Servian forces, under General Putnik, commander-in-chief, and Prince Alexander, were marching on Uskub, the capital of Old Servia. Encountering a Turkish force under Zeki Pasha at Kumanovo, an engagement was fought there on Oct. 23-24, in which the Servians won

a great victory. The Turks fled, leaving behind them 98 field-guns, 15 howitzers, and the road open to Uskub. The losses on both sides were heavy; the Turkish casualties being estimated at 5000. On Oct. 26 Uskub was occupied by the Servian troops, and a few days later (Nov. 2) King Peter made his triumphal entry. In a very short time the Servian troops had swept all over Macedonia, and a detachment was sent to occupy ports on the Adriatic. Monastir, at which the remnant of Zeki Pasha's army had gathered, surrendered on Nov. 18, after three days' engagement in its environs, in the course of which the Turks had 17,000 killed and wounded. At the trifling cost of 1700 casualties, the third largest town in Turkey fell into the hands of the Servians, together with 45,000 prisoners and 66 guns. Alessio, on the Adriatic, was occupied two days later.

Unbroken success likewise attended the Greek army, directed by the Crown Prince, Constantine. Advancing through the mountain defiles of Thessaly, a few minor engagements were fought with a numerically weaker Turkish force under Hassan Tahsin Bey, which retreated towards Salonica, leaving guns and stores behind. The Turks lost 17 guns at Seifidje, and on Nov. 1 were badly beaten at Yenidje near the Vardar. The Greeks crossed the Vardar, and on Nov. 9 Salonica, the 'Hamburg of Eastern Europe,' and the second city of Turkey in Europe, surrendered without further fighting. The Greeks took 20,000 prisoners in this coup

In the west the Montenegrins were apparently content to let disease and starvation, aided by a vigorous bombardment, work its devastating effects on Scutari and Tarabosh, which were closely invested by them and stoutly defended by the Turkish leader, Hassan Riza Bey.

Another notable feature of the war was the presence in the field of all the sovereigns of the allied states. These were King Ferdinand of Bulgaria, Peter of Servia, George of Greece, and Nicholas of Montenegro. From the military point of view one or two facts would seem to have been demonstrated: first, the utility of aeroplanes in war, of which machines Bulgaria had several; second, that the bayonet was still a most effective weapon, especially in a final assault after artillery preparation; third, that the success of the

at any rate, the war was regarded as a holy war, for on Nov. 8 the Sheikh-ul-Islam ordered the preaching of a *jehad*.

So far as the naval side of the war is concerned there is little of importance to record. Three only of the combatants possessed any fighting ships—Greece, Bulgaria, and Turkey. The fleet of the latter country has always been *pour rire*, but it nevertheless served to establish a blockade of the Bulgarian coast in the Black Sea, and it bombarded a few coast towns, notably Varna. Also its presence served as a menace to the Bulgarian left wing before the Chatalja lines. On Nov. 10 the Turkish fleet in the Sea of Marmora bombarded Rodosto, a Turkish town then occupied by the Bulgarians. On Nov. 21 the Turkish cruiser *Hamidieh*, accompanied by two destroyers, was attacked by four Bulgarian torpedo-boats about fifteen miles from Varna in the Black Sea. Turkish fire sank one torpedo-boat and damaged another, but the *Hamidieh* was struck in the bows and commenced to founder. Her captain—Raouf—was, however, able to bring her safely back to Constantinople. On the other hand, the Greek navy (strengthened by four English-built torpedo-boat destroyers bought from the Argentine Republic just prior to the outbreak of hostilities) occupied the islands of the Ægean Archipelago, beginning with Lemnos on Oct. 21, and finishing with Mitylene, Nov. 22. Perhaps the most daring naval feat was that performed by a Greek torpedo-boat which penetrated into Salonica harbour, and right under the guns of the forts fired three torpedoes into the hull of the *Feth-i-Bulend*. On Nov. 12, Turkey—after fruitlessly appealing to the Powers for mediation (Nov. 4)—asked Bulgaria for an armistice. On Nov. 25 delegates met at Chatalja to arrange terms for this armistice and the eventual peace. The armistice was signed on Dec. 3 by Turkey and all the allies except Greece, who maintained that the terms were too favourable to Turkey.

It is estimated that during the first six weeks of the war the Turks lost from all causes 200,000 men. The allies captured 500 guns, 100,000 rifles, and vast quantities of stores and ammunition. The total casualties of the Balkan League are put at 80,000.

After the signing of the armistice, which provided that beleaguered Adrianople and Scutari should not be revictualled, the peace delegates first assembled on Dec. 16 at St. James's Palace, London, and on the following day was held the first meeting at the Foreign Office of the Conference of Ambassadors. Among the more important delegates were Dr. Daneff (President of Bulgarian

Sobranje), M. Venizelos (Greek Prime Minister) and Reshid Pasha, the principal Turkish delegate, whilst the Conference of Ambassadors included the ministers representing the Great Powers in London.

Throughout the whole period of negotiations the Greek forces continued to operate against the Turks—mainly in the Epirus, and for this reason the Turks at first objected to meet the Greek delegates. This objection was eventually waived, and after much delay the issue was fined down to a willingness of Turkey to surrender the Ægean islands and all her European possessions west of Adrianople. Over Adrianople and the islands the Turks assumed a *non possumus* attitude, and for a while the peace conference was suspended. At length, yielding to the pressure of the Powers applied by a Collective Note, the aged Grand Vizier, Kiamil Pasha, advised by the Grand Council he had summoned, agreed to surrender on this point.

While actually engaged in drafting the reply to the Power's Note the downfall of Kiamil's government was brought about on Jan. 23, 1913, by an almost bloodless *coup d'état*, engineered by the Young Turks, led by Talaat Bey and the popular Enver Bey (newly returned from fighting the Italians in Tripoli). In the fracas in the corridors of the Sublime Porte the Turkish commander-in-chief, Nazim Pasha, was killed. Kiamil was succeeded in the Grand Vizierate by the redoubtable Mahmud Shevket Pasha, the leader of the Young Turk revolution of 1908.

The new ministry announced as its policy, 'No Surrender,' and that the retention of Adrianople was a *sine qua non*. In view of this sudden change of front the B. delegates met on Jan. 28, and decided to present the Turkish delegation with a Note. This Note set forth the opinion of the allied delegates as to the inutility of their further remaining in London, as it appeared certain that the new Turkish government was unwilling to cede Adrianople and intended therefore to precipitate a renewal of the war.

No account of the B. War would be complete without some reference to the external forces at work. Hovering in the background were the two Great Powers most vitally interested in the B. peninsula, viz. Russia and Austria. Associated with Austria were her allies of the Triple Alliance, Germany and Italy, while Russia was supported by her ally, France, and that other member of the Entente group, England. Austria's policy was in the main directed towards preventing Servia from gaining territory on the Adriatic Sea, thus cutting off possible Austrian expansion towards Salonica and the Ægean Sea. For this reason she encouraged the idea of Albanian autonomy. On the other hand, Russia, assuming her historic rôle as protector of the Slav peoples, was ranged against Austria. Matters were further complicated towards the end of January 1913 by Roumania's demand for 'compensation' from Bulgaria, a demand which included the cession to her of Silistria. For further particulars, *see* TURKEY.

Balkh, the cap. of a principality of that name in Northern Afghanistan, and once known by its Persian name Bakhtri as the cap. of anct. Bactria. It is situated 23 m. S. of the R. Oxus, and the ruins of its anct. site are still distinctly discernible, having a circumference of at least 20 m. Four miles to the eastward lies the new tn., called Mazr-i-Sherif, the modern Afghan cap. of the prov., with a pop. of about 30,000. It was here that the Greco-Asiatic civilisation first found expression, but prior even to this the magi of Persia founded the Zoroastrian religion. On the death of Alexander the Great it became incorporated with the Greco-Syrian kingdom of the Seleucidæ, and later figured as a centre whence Buddhistic propaganda was disseminated. The natives designate it Am-ul-Beled, mother of cities, and trust implicitly in its rehabilitation to the condition of its ancient splendour. The neighbouring soil is fertile in the extreme, and large quantities of wheat are grown, but deserts and mountainous country are contiguous, and its position almost on the borders of Afghanistan and Turkistan does not conduce to great security.

Balkhash, a great lake lying in the vicinity of the Kirghis steppes, and contiguous to the ter. of Semipalatinsk in Western Siberia. It is 150 m. in length, with a breadth of half that distance, and is the fourth largest inland sea in the Russian Empire. For six months in the year, from November onwards, it is frozen over. During the rest of the year vessels carrying merchandise from one part of the country to another ply busily upon its surface, and many ships are launched from the yards founded by governmental and private enterprise at the mouths of the sev. rivs. which feed it, notably from the establishments at the mouths of the Karatal, Lepsa, and Ili.

Ball, Games of. Originally the game of B. had probably a religious significance, and some of the pastimes into which the use of the B. or sphere

enter, such as the B. game of certain American Indian tribes or that of the ancient Mexicans, are known to have possessed an astronomical basis Again, the struggle of good against evil is thought to have been typified by certain anct. Persian B. games, the sphere in this instance representing the world. In Greece and Rome in classic times various B. games were indulged in by young and old, and in *mediæval England* and France tennis and pell mell were favourite pastimes. In more modern times first golf, native *to either Holland or Scotland*, and cricket were evolved as B. games, and football, perhaps the most popular of all, has been a game of both the Scottish and English people for centuries. Polo and base-ball, the latter a game of American origin, are the most modern B. pastimes.

Ball, Sir Alexander John (1757-1809), served in the Mediterranean under Lord Nelson. In 1799 he was elected by the Maltese as their chief and the president of their congress. He became rear-admiral, 1805.

Ball, Benjamin (1833-93), Fr. doctor, was *b.* at Naples and *d.* at Paris. He became professor of mental pathology in 1877 and member of the Academy of Medicine in 1883. Among his best pub. works on medicine may be mentioned *La Médecine Mentale à travers les siècles*, 1880; *Leçons sur les maladies mentales*, 1881-83; and *La Morphinomanie*, 1884.

Ball, John, an agitator who assisted to stir up the people during the rebellion headed by Wat the Tiler in 1381. His propaganda spread like wildfire among the peasantry, and spurred *them on to many* excesses. On the collapse of the revolt and the death of Tiler he was captured and put to death.

Ball, John (1818-89), an Irish scientist, politician, and traveller. He was called to the Irish bar, 1845; became M.P. for co. Carlow, 1852; under-secretary of state for the colonies, 1855-57; and first president of the Alpine Club, 1857. He pub. *The Alpine Guide*, 1863-68, and wrote works on the Alpine flora and glaciers, and on physical and geographical science.

Ball, John Thomas (1815-98), an Irish lawyer. He was called to the Irish bar 1840, and to the inner bar 1854; and became solicitor-general for Ireland, 1868; attorney-general, 1868 and 1874; M.P. for Dublin University, 1868; lord chancellor of Ireland, 1875-80; and vice-chancellor of Dublin University, 1880. He wrote *The Reformed Church of Ireland*, 1886, and an *Historical Review of the Legislative Systems operative in Ireland*, 1888.

Ball, Sir Robert Stawell, LL.D., F.R.S. (*b.* 1840), the well-known astronomer, was *b.* in Dublin and educated at Trinity College. Lord Rosse, the celebrated authority on astronomy, appointed him his astronomer in 1865, and in 1873 he was created professor of applied mathematics in the Royal Irish College of Science. In the following year he quitted that post to fill the more important one of professor of astronomy at Dublin, with which went the office of astronomer royal for Ireland. Sir Robert is known widely as a lecturer on the popular side of astronomy, and is the author of many works on the science, in which he imparts sound scientific knowledge in a simple and fascinating manner. His best known works of this class are: *The Story of the Heavens*, *In Starry Realms*, and *In the High Heavens*. He has also contributed to numerous magazines and reviews.

Ball, Thomas (1590-1659), a divine. He pub. *Pastorum Propugnaculum*, 1656, a religious treatise.

Ball, Thomas (1819-1911), American sculptor, was *b.* in Charlestown, Massachusetts. In early life he was a distinguished basso, but soon gave up singing for painting and sculpture. In 1852 he made busts of Jenny Lind and Daniel Webster. His other chief works are the statue[illegible]os [illegible]shington in Boston Public Gar[illegible]den, Webster in the Central Park [illegible]ng of New Yo[illegible] and the group of 'Er[illegible]mancipation' in Washington. *See* his *Years and Ten*, 1891 *My Threescore Years and Ten*, 1891

Ballachulish, a [illegible]s of Loch Leve[illegible] the southern bank [illegible]nop. of about 1000. Argyllshire, with a [illegible]y [illegible]. The staple industry is the quarrying of marble and slate, of which latter nearly 12,000 tons are produced yearly. The name is derived from the Gaelic *Baile-na-coolish*, the village on the strait.

Ballad, a poetical composition narrative in matter and lyrical in form which generally recounts some specific legend, tale, or story, more or less complete. This type of composition was known to the Gks. and Roms., who utilised it for laudatory purposes and to keep green the memory of heroic deeds and noteworthy happenings. Such ballads were almost invariably accompanied by symbolical dancing until the fashion of accompanying them on the lyre or harp brought the custom into desuetude. Subsequent to the fall of the Roman empire we find the saga form in general use among bards, jongleurs, and minstrels, and there is little doubt that the ballad as we know it to-day was evolved from it. The saga, with its interminable adventures, genealogies,

and combats, would naturally give way to a less wearisome form which, besides affording its hearers a brief and striking narrative, would also charm them by its intimate humanity and its appeal to the memory. On the other hand, it is advanced with some show of reason that the saga may have grown from a collection of Bs. on any cognate subject, for example, the siege of Troy or the deeds of any mighty hero or house of heroes as the Nibelungs or Giukings. But it is in its lyrical form that we must here consider the B., which originally received its present name and shape in the Italy of the 12th century. It is, however, in Northern Europe rather than in the home of its modern origin that the B. has risen to highest distinction, and although the Bs. of the Ger. poets Uhland, Bürger, Goethe, and Schiller certainly touch a level of the highest excellence as regards both composition and romantic feeling, it is to our own country we must look for the B. in its most natural and therefore perfect form. Perhaps the most perfect specimens of the British B. are those to whom no authorship can be assigned, but the works of Scott, Burns, Wordsworth, Tennyson, and Coleridge teem with examples which combine the simplicity of the originals of this type of story-song with the most consummate artistry.

What is true of folk-lore may be also held true of folk-song. The plots utilised in the B. are few and of world-wide acceptance. As the epic, folk-tale, fairy-tale, and märchen are all universally wrought on the basis of a few venerable plots, so the material for the folk-song is almost equally scanty. These bases of the B. are among the romantic heritage of the sev. European peoples as much as is the story of the 'fatal children' common to all mythologies, or the tale of the neglected daughter, the origin of so much matter of faery. We may even be enabled to trace mythologic processes in the B., but we will first examine its universality. We have, for example, the tale of the girl who follows her 'fause luve,' although she is well aware that he is about to take unto himself another 'may' for reasons of policy. She invariably disguises herself as a page, and is discovered to be a woman by the keen-sighted mother of her cavalier, who, touched by her faithfulness, intercedes for her, and she is happily wed to the recalcitrant gallant of her heart. Such is the subject-matter of *Burd Ellen*, one of the most touching and tender ever sung to the harps of the 'North Countree,' and such is the plot of the Bs. in French, Danish, and other tongues. Again, we have the B. of the girl who, doubting her lover, is taken by him to a secret place, and is there told by him that she must die. By a trick she succeeds in taking his life instead. Such a plot is not confined to Bs. in our own tongue, but is almost universal. In the Bs. of Bürger and Goethe, modelled on older types, we notice that the shades of the departed act as if alive. They return to lie beside their lovers until cockcrow, and ride on swift steeds on which they often carry off the object of their earthly affections. So acts Clerk Saunders in the old Scottish B., and so do scores of ghostly wights in the Bs. of all lands. This conception is undoubtedly drawn from Norse mythology. For example, we find in one of the Norwegian sagas the wife returning to the dead husband who is buried in the great mound on the moor by his dwelling. We thus find the same machinery employed throughout the Bs. of many lands, however different the local colouring may be. But there are other marks which betray the universality of B. idea beside sameness of plot. For example, we are never far away from the talking bird or the chorus of birds, the 'wee birdie' of the Scots Bs. which with warning accents bids the 'bonnie may' beware of the 'fause Sir John.' Again, we find that the generality of ballad-mongers have a decided partiality for gold and silver, and that the heroes and heroines of their songs are always mightily bedizened. They are liberally bedecked with the 'red goud,' and 'siller' is always plenteous. They have 'roses till their shoon,' and a great display of feathers. Their body-linen is invariably white as snow, and the cramosie and satins they wear are minutely specified with all the snobbery of a sycophantic bardhood. But there is wretchedness too. Hynd Horne and his like who come to claim their own are dressed as beggars, but the lordliness shines through their rags, and after receiving hospitality—they usually ask for a drink for the sake of their own memory to find how it will be received—they stand forth in their native dignity and are duly remembered. In the refrains of such—in *Hynd Horne* it is 'The birk and the broom blooms bonny'—we find many allusions to plants. We know not the wherefore of this popularity of the heath plants, which permits their names to recurin B. refrain alternately with 'down-derry-down,' and the like, but some deeper significance probably lurks behind what would seem to be mere caprice. Ghastly crime is often, too, found in the B. *motif*. The Lammikin who slaughters his may, the luckless 'childe' who is drowned or smothered

—invariably the possessor of 'gouden locks'—recur among the old unhappy far-off things with the dastard groom who goes in his master's stead to his lady's bower, and is slain by his exasperated lord.

In the limits of such an article as this an extended review of B. literature is manifestly impossible, and a brief history of the B. form in the sev. European countries in which it has found favour must necessarily suffice.

The B. in Britain.—No balladforms of British origin of a greater antiquity than the 14th century may be said to have come down to us. Of the 13th century we have such specimens as *Kyng Horn, Sir Tristrem, Haveloc,* and *Sir Gaywaine,* which partake more of the nature of extended romances than Bs. proper, and it may be further laid down that any specimens of a date anterior to this are mere Eng. translations of Fr. examples. In the 14th century the native Eng. composition began to find favour with the people to the detriment of the Fr. importations, and the era of its introduction appears to have been that of its highest ascendancy and its most abundant and felicitous production. In succeeding centuries other forms claimed popular attention to a much larger extent, and as they made no demand upon the memory and appealed to a public which had become familiar with reading, the B. form became gradually neglected and remained so until the period of its rescusitation by Bishop Percy, after a period of nearly 300 years. In his *Religues of English Poetry* that celebrated litterateur and antiquarian unquestionably laid the foundation of that immense vogue of the romantic which dominated Eng. poetry for the next century, and which culminated in the wondrous era which produced Scott, Coleridge, Wordsworth, Southey, Byron, and Shelley. Scott, fired by a deep patriotism, set the torch which he had lit at the embers of chivalry to the great dry heap of romanticism and ignited the whole. Burns had rescued the songs of the people, the love songs, with their exquisite home-touches and tender sentiment, but had left the romantic untouched. At the blaze ignited by Scott, Coleridge and the Lake brotherhood lit their torches, and while they and Hogg—with his marvellous *Kilmeny*—surpassed Scott so far as poetical ability was concerned, they did not succeed in infusing into their work that true spirit of romanticism of which he appeared to have held the secret. 'Monk' Lewis, too, must not be forgotten in a review of the resuscitated B. His *Tales of Terror and Wonder,* collected from all lands, bring out the weird in contradistinction to the romantic, and succeeded in bringing upon his head equal stricture with the 'stale romance' of Scott from Byron—afterwards only too fain to truckle to the prevailing taste, and to add the Mediterranean to the realms of won der conquered by his compeers.

The material whence *Minstrelsy of the Scottish Border* and its like was drawn, was in all probability for the most part 'made' in the 15th and 16th centuries. The *Ballad of Sir Patrick Spens,* for example, is regarded by some as a modern forgery, yet in its machinery and circumstances it bears the stamp of eld. It was probably written in the 16th century from a still older B. contemporary with the times of which it sings—the days succeeding the death of Alexander III. of Scotland, when the Maid of Norway was called to the throne. We may take it that, as Scott so shrewdly says, all the B. matter that came down to his time had been so 'vamped and re-vamped' as to have lost completely its original form and phraseolo
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strange to find matter superior to that of the contemporary poets of the sev. eras through which these Bs. passed and survived handled by the mere verse-makers of the day, whose doggerel still clings like noxious weeds to the fairy-like and anct. phrase of the higher poesy round which it has clustered. For it was not the Chaucers, the Dunbars, the Lindsays, or Spensers who fostered the B., but the Blind Harrys, the Hucheons, and the 'burral' or rustic minstrels who, voiding the courts, were content to string their rather tuneless harps in the halls of the 'backwoodsmen' of their day and at the junketings of the lesser gentry. Of the work of the nameless B. makers who produced such marvels as *The Banks o' Yarrow, Helen of Kirkconnel,* and *Binnorie*—are they not written on the heart of hearts of the people as the more elegant and studied phrase of poetry proper can never be, and have they not an abiding place there surer than law, custom, or the loyalty that keeps the crowns of kings?

The literature of the British B. has been examined by Furnivall, Ritson, Madden, Halliwell, and others, and especially by Professor Child, whose works will be found particularised in the bibliographical note.

The B. in Germany.—Although the volkslieder of the Ger. peoples is a form of considerable antiquity it probably attained its present type at

the hands of those minnesingers who clustered around the courts of the landgraves and petty kings of the Germany of the middle ages. At the court of Hermann, Landgrave of Thuringia (*c.*1180-*c.*1200), poetical effort reached a high standard, and such singers arose as Wolfram von Eschenbach and Gottfried von Strassburg. Such 'epics' as the *Parzival* and *Tristan* of these poets were the lineal ancestors of the B. form, and we find their echoes in many a later effort. In the *Heldenbuch*, or great book of national heroes, and the *Nibelungenlied*, we find gathered together a number of Bs., the sequence of which assists to make up a completed whole. During the 15th century, amid a perfect riot of taste, a satiric type of B. arose, and was succeeded by the uproariously comic B. of which the well-known *Till Eulenspiegel* is the form *par excellence*. During the Lutheran period the B. lingered in corners, and kept to its retreats during the sterile reign of Gallicism. But upon the great romantic renaissance which in Germany had as its protagonists Klopstock, Wieland, and perhaps Lessing, the B. returned to fostering influences, and in the hands of Bürger, Goethe, Schiller, and Uhland attained a marvellous perfection. The Bs. of modern Germany do not possess the almost childlike brightness of those of the old minneleider, but are marked by a gloomy grandeur and a variety of colour which rise into a lofty mysticism. The realistic movement of to-day may be said to have once more banished the B. from the arena of Ger. literature if not from more popular appreciation.

The B. in France.—The troubadours and trouvères of early French literature were the makers of the songs of love and chivalry, the lyrists of early France, and had no hand in the making of Bs. But this went on all the same contemporaneously with their more pretentious efforts. The earliest B.—perhaps the only one of early origin that has survived—is that of *Aucassin and Nicolete*, and with the withering of the Langue d'Oc before the Langue d'Oil practically all the B. poetry of the former dialect must have vanished. We may be pretty sure that such 'epics' as the *Chanson de Roland, Ogier le Danois*, and the like, were merely a conglomeration of Bs. During what may be called the Arthurian period the B. appears to have been lost among the rich growth of a romance which, if it partook of the B. form, and was sung in the same manner as a B., was yet too extended in its efforts to justify its inclusion in the same nomenclature. In mediæval France, in short, the B. ran to a more extended and epic form, and thus lost that simplicity and brevity which was its very soul. It must also be recollected that it had to cope with a full-fledged literary taste which had no occasion for a simplicity which it would unquestionably have confounded with mere rusticity. It is not until the 15th century that we get back to anything like the B., the rather affected and frigid efforts of Charles d'Orleans possessing some slight affinity with its *genre*. Villon, too, had B. affinities which, however, were counterbalanced by his richness of fancy and display of effort. The lyric splendour of Ronsard and his coadjutors cannot be said to possess any points of resemblance with the B. With the rise of the romantic school in 1830, the B. came back to its own, and in the works of Victor Hugo, Gautier, Sainte-Beuve, and Deschamps received liberal treatment and recognition.

The B. in Spain.—Spanish literature is rich in Bs. Perhaps the earliest type is that of the *Poema del Cid*, probably, like most early epics, composed of numerous Bs. joined into a compact whole. The transition of these 'Cid' Bs. to the prose chronicle of the same name was easy, as was the foundation of many romances on the prose 'Cid.' But the strife with the Moors inspired shoals of Bs., which in their turn might have been welded into another epic like the 'Cid' had the master-hand been present. These are mostly anonymous, and deal with the deeds of noble knights, the love of fair ladies, Spanish and Moorish, and other chivalric matter. A good idea can be had of the quality of these Bs. by a perusal of Lockhart's *Spanish Ballads*. In Spain the B. has mostly to do with romance pure and simple. A peasant or bucolic muse arose quite separately, but although it approximates at times to the B. type it cannot altogether be classed with it. The Bs. of Spain are in general composed in a richer and more varied metre than those of other European countries, and have furnished many British poets with models for the composition of narrative verse.

In other countries of Europe the B. may be said to have followed a course similar to that indicated in the case of those countries dealt with. The foreign type of B. which bears most resemblance to the British is the Scandinavian (Dan., Norwegian, and Swedish), and there can be no doubt that sev. of our Bs. are direct Scandinavian importations, whilst the reverse can also be maintained. Norman-Fr. forms also display some

connection with ours, and the Bs. of Brittany exhibit what might be described as a territorial connection with those of this country. The B. is by no means confined to Europe, and the various Asiatic countries possess forms which closely approximate to the European. S. America, too, has a B. literature of its own, and even the United States is by no means destitute of folk-songs cast in B. form.

Literature.—The chief authority on the subject of Bs. was the late Professor Child of Boston, who incorporated the fruit of years of labour in his *English and Scottish Ballads*, Boston, 1897-98. It contains a valuable bibliography. There may also be consulted the *Leabhar-na-Feinne* of Campbell of Islay, London, 1872, for Gaelic Bs., *Ancient Popular Poetry of Scotland*, by Dr. David Laing, and the well-known collections of Ritson, Percy, and Scott.

Ballad, in music, a song which partakes of the character of the folk-song, on the model of which it is founded. It is a favourite type of drawing-room melody, and is distinguished by a certain plaintiveness and romantic atmosphere. Many modern composers have distinguished themselves in this form of song, the most modern type of which, the 'art-song,' may be said to have in some measure evolved from the ballad form.

Ballade, a form of verse consisting of three stanzas of eight or ten lines, concluding with an *envoi* of four or five lines. Each stanza must include three rhymes only, and the same three in the same order must run throughout the B. Each stanza, as well as the *envoi*, must have the same refrain. The *envoi* usually contains the dedication of the poem to some particular person, and often commenced with the title of the person to whom it was addressed, as 'prince' or 'sire.' It forms the climax of the poem. The B. is usually classed by prosodists among the forms utilised as *vers de société*. It must not be confounded with the ballad (*q.v.*). Modern Bs. of excellence have been written by W. E. Henley, Swinburne, Wilde, G. K. Chesterton, and others. It is essentially an antique form modernised, and was probably first perfected by Villon.

Ballagi, Moritz (1815-91), Hungarian philologist and Protestant theologian who studied at Paris and at Tubingen. He founded the journal *Protestans egyhazi és iskolai lapok;* but he is chiefly known as a philologist, his works consisting of Hungarian-Ger. dictionaries and a grammar.

Ballance, John (1839-93), New Zealand premier, was born in Glenavy, Antrim, Ireland. He emigrated to Wanganui, where he was first a shopkeeper, then a journalist, and the founder of the *Wanganui Herald*. In the Maori War of 1867 he took an active part, and received a war-medal for his services. In 1875 he entered the House of Representatives; in 1878 became treasurer in Sir George Grey's ministry; resigned in 1879. He re-entered parliament in 1884 as minister of lands and native affairs; became leader of the Liberal opposition in 1889, and prime minister in 1891. In politics he showed himself broad-minded, and his treatment of the Maoris was kindly and pacific.

Ballanche, Pierre Simon (1776-1847), a Fr. philosopher of the theocratic school, born at Lyons. Early in life he succeeded in joining the literary circle represented by Madame Recamier and Chateaubriand, and by dint of the freshness of his reasoning and the originality of his mind he shortly became well known. His prin. works are *Palingenesie*, divided into three parts: I. 'L'Orphee;' II. 'La Formule;' and III. 'La Ville des Expiations.' In these works he may be said to outline the history and philosophy of the world, past, present, and future. His later *Vision d'Hebal* contains the suppositious prophecies of a chief of a Scottish clan gifted with second sight, who sets down what he sees of the future history of the earth. As a member of the theocratic school B. naturally placed revelation before reason, and order above freedom.

Ballande, Hilarion (1820-1887), a Fr. actor and author. He played at the Odéon, Paris, and at the Comedy, and in 1869 founded Sunday literary matinees, which were held in the Gaîté, and in the Porte-Saint-Martin. He afterwards became a theatrical manager at Paris. His chief works are: *L* [illegible] *gne*, a poem, [illegible]; and *Les Gr* [illegible] rama.

Balla [illegible] '7), a native of Edinburgh. He is deservedly famous for his *Gaberlunzie's Wallet*, a miscellany in which the various items are supposed to be drawn from the wallet of a wayfaring pedlar. He was also the author of *The Miller of Deanhaugh*, and of some of the liveliest of Scottish humorous songs, which he was in the habit of singing himself with great gusto. He completed under numerous disadvantages successful designs in a competition, the purpose of which was to provide stained glass windows for the House of Lords in 1844.

Ballantine, Serjeant William (1812-87), was born in London. He was a famous cross-examining counsel of the older school. Educated at St.

Paul's School, he was called to the bar in 1834, and being disposed to a literary and theatrical life, soon acquired a number of friends connected with these professions. His most famous case was the celebrated one in which he defended the Tichborne claimant, but he successfully carried off several *causes célèbres*, especially that of Franz Müller, who was tried for murder in 1864. He also acted for the Gaekwar of Baroda in 1875, and received perhaps the largest fee for so doing on record. He died at Margate.

Ballantrae, a small fishing vil. in S.W. Ayrshire. It has been brought into prominence of late years from the fact that R. L. Stevenson's novel *The Master of Ballantrae* deals to some extent with its topography. Formerly it was a reputed haunt of smugglers. It has now some vogue as a summer resort. The pop. numbers about 500.

Ballantyne, James (1772-1833), an eminent editor and publisher, was *b.* at Kelso. As a young man he founded the *Kelso Mail*, and was the first to introduce an improved style of printing into Scotland. This attracted the notice of Sir Walter Scott, whose productions he printed, not hesitating to advise certain alterations in the subject-matter of the manuscripts. In 1826 the company of which he was the head became involved in the bankruptcy of Messrs. Constable, their liabilities amounting to £102,000. Ballantyne distinguished himself in the eyes of his contemporaries as a judge of dramatic literature.

His brother John was born at Kelso in 1774. He took an active interest in the business of his brother, and was widely known as a judge of art objects and works of antiquity. He pub. separately a number of celebrated works, notably Scott's ed. of the *British Novelists*, and the works of Beaumont and Fletcher. He also ed. two periodicals, *The Visionary* and *The Saleroom*, the bulk of the matter in which was provided by Scott. He died at Melrose, June 16, 1821, aged forty-seven.

Ballantyne, James Robert (*d.* 1864), an orientalist; was superintendent of the government Sanskrit College at Benares from 1845; and librarian to the India Office, London, 1861. He made translations from the Sanskrit, and wrote on oriental subjects.

Ballantyne, Robert Michael (1825-94), a well-known writer of boys' books, was *b.* at Edinburgh. His descriptions of the life of the trapper and hunter dwelling in wild outposts have rendered his tales of world-wide celebrity among the boys of two generations, and his almost journalistic method of writing from personal experience has given his work a value not often associated with fiction of its class. Among his best known books are: *Ungava*, *The Coral Island*, and *Masterman Ready*.

Ballantyne, Thomas (1806-71), a journalist who was the editor of the *Bolton Free Press*, *Manchester Guardian*, *Liverpool Journal*, *Mercury*, *Leader*, and *Old St. James's Chronicle*. He also started the *Statesman*, was concerned in the corn law agitation, and ed. *Selections from Carlyle and other Writers*.

Ballarat, or Ballaarat, a city of Victoria, Australia, 96 m. W.N.W. of Melbourne, famous for its goldfields, which were discovered in 1851, and still yield a considerable revenue. But whereas the auriferous soil was found almost at the surface in the middle of last century, it has now to be sought at a depth of nearly 1000 ft., and quartz mining has become the staple industry of the dist. The community is divided into B. E. and W., the pop. of the two portions aggregating over 50,000. The city is modern in construction, and possesses many handsome buildings, besides factories, breweries, and mills which cater to local consumption. There is a railway line from Melbourne. In the old goldmining days B. was a typical miners' centre, and the pop. gathered there had something of a reputation for lawlessness. On Dec. 3, 1854, the method of licensing miners brought about a serious riot which culminated in a veritable battle known as 'The Eureka Stockade,' where over 500 miners were attacked by 270 troops and police, who quickly captured the stockade, and about 30 miners were killed and some 60 wounded, whilst 125 prisoners were taken.

Ballard, the name of a famous family of Fr. printers of music who held the monopoly of their business for two centuries, handing it down from one generation to another until the Revolution. They were enabled to resist all innovations in music-printing by their privilege, and were supported by the court. Robert B., the founder of the firm, received his privilege from Henry II. in 1552; his son Pierre had it confirmed by Henry III. and Henry IV.; his sons, Robert by Louis VIII., and Christophe by Louis XIV.: Jean-Baptiste-Christophe, son of Christophe, by Louis XIV.; his son Christophe-Jean-François by Louis XV.; and his son Pierre-Robert-Christophe by Louis XV. in 1763, after which monopolies were abolished by the Revolution.

Ballast, a term used to denote any weight placed in a ship's hold, with the object of sinking her deeper in the water, to secure proper stability and

safe sailing, when her cargo is too light. B. may consist of gravel, stone, sand, iron, or water. Modern steamers carry tanks forward, aft and amidships, which can be filled with water to regulate the trim of the boat. The term is also applied to bags of sand and gravel used to steady a balloon. The word is used in engineering to denote the gravelly material laid as packing between railway sleepers.

Ballater, a vil. *in* Aberdeenshire on the R. Dee, 36 m. W.S.W. of Aberdeen. From its proximity to the royal residence of Balmoral and the numerous beauty-spots of that part of Aberdeenshire, it is a favourite tourist centre. It is renowned for its chalybeate springs. *Pop.* about 1000.

Ball Bearings, an arrangement of hard steel balls surrounding a shaft or axle, intended to lessen friction by substituting rolling for sliding contact. Where a fixed bearing is used, the journal, or portion of the shaft within the bearing, slides over the surface of the encircling material; such movement not only causes the wearing out of the parts in contact, but necessitates work being done to overcome the friction. Both of these disadvantages may be minimised by efficient lubrication, that is, providing a thin film of oil between the journal and the bearing. Theoretically, the resulting friction is reduced to the reluctance of the fluid to move over either surface; but practically it is impossible to maintain an absolutely continuous film of oil. For light loads and moderate speeds it has long been the custom to place a row of balls between hardened surfaces, called ball-races, on the rotating piece and the stationary piece. The balls roll over these surfaces if properly adjusted, and the only sliding friction which occurs is between ball and ball, and if the balls are of good shape and well lubricated, this is not considerable. The qualities of an efficient B. are therefore: hardness in the balls and races, perfect sphericity and equality of diameter in all the balls and a good lubricating arrangement. The races may be plane or concave, the best results being obtained where the races are curved to a radius of two-thirds of the balls' diameter.

Ballenstedt, a tn. in the Duchy of Anhalt, Germany. It is situated near the Hartz Mts., and contains a palace of the dukes of Anhalt, famous for its library and paintings. The tomb of Albert the Bear, Margrave of Brandenburg (1100-1170), was recently discovered there. *Pop.* 1900.

Balleny Isles, a group of volcanic islands in the Antarctic Ocean discovered by Mr. John Balleny and Mr. H. Freeman, the commanders of two vessels sent out on a sealing expedition to the South Seas, in 1838, by sev. merchants in conjunction with Messrs. Enderby of London. The group was first seen Feb. 9, 1839. It consists of five islands which, proceeding from E. to W., are called Sturge Is., Buckle Is., Borradaile Is., Young Is., and Row Is. Young Is. rises to a peak, called Peak Freeman, which is 12,000 ft. above the sea-level. Whales, penguins, seals, Cape pigeons, and small white birds are numerous, and the only animals seen. Fogs are frequent and thick; and navigation in the neighbourhood of the islands is dangerous in consequence of icebergs and drift-ice.

Ballerini, Peter (1698–*c.*1764), an It. theologian and author. His work entitled *Il Metodo di san Agostino degli studj* (1724) excited much interest, and was one of the causes of the quarrel with regard to probabilism. He was helped in his works by his brother Jerome (1702-*c.*1770).

Balleroy, Albert, Comte de (1828-73), Fr. artist, was *b.* at Igé in Normandy and *d.* in Paris. His paintings consisted of hunting scenes and pictures of animals; they were carried out on a large scale, and his execution was vigorous and bold. The painting of 'Dogs Running' was exhibited in the Salon in 1853, and his 'Death of a Stag' gained him a medal from the Salon in 1867.

Ballestros, Don Francisco (1770-1832), Spanish general, was *b.* at Saragossa, and *d.* in Paris. He served in the campaigns against the Fr. in 1793 and 1795, became minister of war under Ferdinand VII. in 1815, and vice-president of the provisional ministry of 1820. After the Fr. invasion of 1823 he was condemned to death, but escaped to Paris, where he died nine years later.

Ballet, The, in all probability originated in the semi-religious dance ceremonies common to nearly all primitive peoples, in which certain mythological personages are represented as enacting in dumb show various incidents in their careers. Thus we have well-defined Bs. in the dance ceremonies of the snake societies of the Hopi and Moqui Indians of New Mexico and Arizona, the Güegüence B. of the Maya, and the theatric Bs. of the people of the South Sea Is. In anct. Greece the corybantic dances partook of the nature of Bs. In mediæval Europe the B. seems to have been more nearly evolved from the spectacle with which we find the courts of Charles IX. in France and James IV. in Scotland especially connected. From these, as from the early pantomime of Italy in the late 15th and the 16th cen-

turies, we find the B. proper emerge in 16th-century France, where one, Baltagerini, master of the music to Catherine de Medici, developed the B. Comique, which later had rival forms in the B. Heroique and the B. Historique. Later, the mythological matter of Greece and Rome found favour as B. subjects in the eyes of the Grande Monarque, who did not disdain to take part in them, and who alluded to himself as 'The God of Dancing.' The B. form of modern times was first given its present shape by Noverre, who in the middle of the 18th century attempted to treat the highest themes in the light of this art-form. The B. in England has departed considerably from the more classic type still in vogue on the Continent, where the various centres of grand opera maintain schools for the training of persons of both sexes in the art. Especially famous are the schools connected with the operas of Paris, Brussels, Milan, Berlin, and St. Petersburg, the *personnel* of the last of which has recently aroused enthusiasm in the country by its performances. Differences in training exist between the Fr. and It. schools, but the latter is thought to adhere to the more rigidly classical forms and methods. In England the principal centres of the art are the Alhambra Theatre and Empire Theatre in London, which periodically produce Bs. which for splendour of equipment and scenery and novelty of idea are unsurpassed elsewhere. But these exhibitions are to a great extent lacking in the artistic atmosphere, discrimination, and adherence to the best classic ideals which mark productions of a similar character abroad. The prin. exponents of the B. in England are Mdlle. Adela Genée, a lady of Danish extraction, and Mdlle. Lydia Kyasht, a Russian dancer, who appear in most of the productions at the prin. London houses. The Lanner family have for many years been the premier individual trainers of this form of dancing in England. The dancing of Mdlle. Pavlova, the *première danseuse* of the Imperial Russian B., who recently visited this country, has been greatly admired as affording a completely novel and illuminating conception of the best continental methods. The B. has naturally had some considerable effect upon music, and many of the most remarkable if not the greatest efforts of composers of note have been directed towards it. The B. music of Schubert, Gounod, Delibes, Massenet and others is too widely known to require description. Perhaps the first opera in which the B. was connected with the opera proper was the *Orfeo* of Gluck, who wrote special music for the accompanying ballet.

Ball-flower, an ornament in Eng. Gothic architecture, resembling a ball placed within a circular flower, sometimes with three, sometimes with four petals. It is characteristic of the Decorated style of the 14th century. It is supposed by some to be an imitation of a pomegranate, and by others of a hawk's bill.

Ballia, a tn. in the United Provs. of Agra and Oudh, N. India, 70 m. E.N.E. of Benares. Noted for the bathing fair, held in November. Pop. about 16,400.

Ballin, Albert (*b.* 1857), a Ger. merchant, managing director of the Ger. steamship company, the Hamburg-America Line, which he joined in 1880, and which owes its success largely to his business enterprise.

Ballin, Claude (1615-78), a Fr. goldsmith, who occupied much of his time in copying the works of Poussin, and who was employed by Louis XIV. on various designs. His nephew, Claude B. (*c.* 1660-1754) was also a noted goldsmith, his chief work being the coronation crown of Louis XV.

Ballina, a seaport in counties Mayo and Sligo, Ireland, on both sides of the R. Moy, 7 m. from Killala Bay. The Sligo portion is properly called Ardnaree, a suburb of B. The R. Moy and Lough Conn are favourite resorts of anglers, as there is excellent salmon fishing. Coarse linens are manufactured, and there is trade in all kinds of agricultural produce. The Fr. took possession of the town in 1798, but shortly afterwards were defeated at Killala. There is a Roman Catholic cathedral. Pop. (1901) 4505.

Ballinasloe, a small but prosperous mkt. tn. in Connaught, on the borders of counties Galway and Roscommon. It is situated on the Suck, a trib. of the Shannon, and is further connected with the Shannon by the Grand Canal, opened for commercial purposes in 1828. There is a celebrated wool fair held on July 13, and the cattle fair in October lasts four or five days. There are breweries and flour-mills, and tanning, hat-making, and carriage-building are among the other industries of the tn. Garbally Castle, in the neighbourhood, is the seat of the Earl of Clancarty. Pop. (1901) 4904.

Ballinrobe, a small tn. in co. Mayo, Ireland, on the Robe, near its mouth in Lough Mask, 27 m. N. of Galway. Pop. about 2200.

Balliol, *see* BALIOL.

Balliol College, a college of the Oxford University. Its foundation is attributed to Sir John de Baliol of Barnard Castle, Durham, and his wife, Devorguilla, the parents of John Baliol,' King of Scotland. John de

Baliol was a keen supporter of Henry III. in his wars, but as an act of penance for the injuries done to sanctuaries in his neighbourhood and to show his pious love of learning, he maintained sixteen poor scholars of Oxford between 1262 and 1268. On his death Lady Devorguilla completed his project of founding a residence for these scholars in 1282, and other benefactors added gifts of money, land, and church livings. Part of the library dates from 1430, but many new buildings have been added during the last century in the Gothic style. The college is endowed with many scholarships and exhibitions, and consists of a master, twelve fellows, about fifty scholars and exhibitioners, and the undergraduates, on an average, number over 200. B. boasts of many brilliant scholars, and has been the home of the champions of many intellectual and social movements. Wyclif was its master about 1360, when scholastic philosophy was cultivated within its walls. In the 15th century it harboured many Eng. humanists, including Humphrey, Duke of Gloucester (one of the founders of the Bodleian Library), and the Earl of Worcester. In the 19th century it contributed Cardinal Manning to the Oxford Movement. Among its distinguished graduates are Dr. Adam Smith, J. G. Lockhard, Robert Southey, Matthew Arnold, Swinburne, and Andrew Lang.

Ballista, an engine used by the Roms. for propelling heavy missiles in siege operations. It was constructed on the same principle as the catapult, the difference being that the catapult was used for propelling arrows in siege and field warfare, whilst the B. discharged heavy beams and stones for the battering down of buildings. The motive power in both types of engine is supplied by tightly twisted hemp, sinews of animals, or raw hide. Two such skeins are firmly fixed vertically in a heavy wooden framework: two stiff wooden arms are inserted in the skeins and are attached to a bow-string which is drawn back by a winch and locked by a trigger mechanism. The projectile is propelled through a window in the vertical framework.

Ballistic Pendulum, an instrument invented by Benjamin Robins about 1740 to measure the velocities of warlike projectiles. It consists of a large wooden box coated with iron and filled with sand to the weight of from three to five tons. The pendulum is suspended from a strong horizontal beam, and is deflected by the impact of a projectile, the amount of deflection enabling the velocity of the missile to be calculated. If the gun is fastened to the pendulum and fired, the reaction causes a deflection by which the muzzle velocity of the shot may be deduced.

Ballistics, the science of propelling projectiles from warlike engines. It includes the study of the conditions determining the flight of missiles through the air, such as air-density, shape and weight of projectile, effect of rifling, etc., and aims at constructing tables and other referenda to enable the gunner to estimate the range of shot fired under various conditions of elevation, etc. Another branch of the subject, called interior B., deals with the phenomena connected with the discharge of explosives within the gun, the temperature and pressure of the released gases, the movement of the shot along the barrel, the stress occasioned in the material of which the gun is composed, etc.

Ballistite, a smokeless explosive formed from guncotton. It is very similar in composition to cordite and the various blasting gelatins, and has been utilised by the Italian gov. for military purposes.

Ballium, *see* BAILEY.

Balloch, a vil., Dumbartonshire, Scotland, on Loch Lomond, on the N. British Railway; it is a terminus for the steamers on the loch.

Balloons. The science of aerostation is not so old as that of the sister science, aviation. But even in the case of this science we can trace it to some slight extent, at any rate, to the period of the dark ages and of mediæval times. The earliest attempts at artificial flight, however, were, until well into the 13th century, confined to various attempts to imitate the flight of birds, and the means usually employed was artificial wings. Although, however, the science of aviation is the older of the two, the younger science was the one which most speedily reached any degree of success. During the 13th century we get many attempts, either theoretically or practically, to solve the problem of aerostation. Many of these were fantastic in the extreme, many of them were impracticable, but the great point to be remembered, was that with the wave of new learning which at this time was about to spread over Europe, the minds of the new age had before them the problem presented by artificial flight, and sooner or later, in spite of failure and phantasy, the problem would be solved. The flying dove of Achytas, the experiments and theories of Roger Bacon and Albert of Saxony have been dealt with elsewhere (see AVIATION). The fantastic i
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were,

which was at the time facing a part at least of the thinking world. Francis Lana failed to solve the problem, yet, at the same time, made great strides in the right direction; the science had also attracted the attention of Leonardo da Vinci (*see* AERONAUTICS). The experiments of Francis Lana had been carried out in the 17th century, and though unserviceable, they had been on the right lines. But it was in the next century, and even towards the end of that century, that the solution of the problem appeared to be in sight. The experiments of Cavendish and the writings of Priestley had been made during that century; they had attracted considerable attention, and among others who had been attracted by the results of Cavendish's experiments, were two brothers, Joseph and Etienne Montgolfier, the sons of a paper merchant of Annonay, in France. That they did not fully solve the problem, nor yet understand the full significance of the experiments of Cavendish, is now fairly obvious, but the development of the B. and the research which has led to the practical perfection of the science of aerostation, date from the first experiments of these brothers with their fire Bs., or Montgolfières, as they came to be called later. In 1783 a bag made of linen was inflated over a fire of chopped straw, and rose to a considerable height. The brothers who were responsible for the experiment came to the conclusion that it was due to the smoke from the fire. They overlooked the important and true reason, but they commenced the art of successful B. flight, and were to all intents and purposes practically the inventors of the fire B., or, as has been already remarked, Montgolfières (*see* AERONAUTICS).

This success of the brothers Montgolfier roused intense enthusiasm in France, and their experiments attracted wide attention. The physicist Charles, however, who knew from his experiments with hydrogen the real cause of the ascent of the B., was entrusted with the work of making a hydrogen B. He realised the necessity for making the B. thoroughly airtight, and so his B. was made of silk and coated with a rubber solution. The ascent was successfully made in Aug. 1783, amidst the plaudits of an enthusiastic Parisian crowd. The B. rose to a considerable height, but fell some distance from Paris, and was torn to pieces by an infuriated and terrified peasant mob. The brothers Montgolfier in the meantime continued their experiments, and attained a certain degree of success, being enabled to send up a B. that contained a number of animals; they were given enthusiastic receptions throughout France, and received rewards at the hands of royalty. The next step in the evolution of the B. was the construction of a B. that would carry passengers. An ascent in a captive B. was made by one Pilâtre de Rozier in Oct. 1783, and the same aeronaut made an ascent with the Marquis de Arlandes in a free B. during the same year. In the following year an ascent was made by a certain Madame Thiblé, who has therefore the honour of having been not only the first lady aeronaut, but also one of the pioneers of the movement. But the many experiments which were made with Montgolfières showed that the B. of that type was not entirely practicable nor very serviceable. The B. was often burnt during the inflating process, sometimes they caught fire in the air; more often, after a successful descent, the B. was destroyed owing to the body of the B. falling upon the pan which had contained the fire, and which was often, even after the descent, hot enough to set fire to the whole B. A great controversy waged for some considerable time as to which of the types of B., Montgolfières or Robertières (sometimes called Charlières), were the most serviceable. The type of B. used by the physicist Charles did not differ essentially from the modern type, and ultimately it was in favour of this type that opinion veered. The hydrogen B. of Charles was fitted up with a net which covered about half the B. and was used to support the silk covering and also to distribute the pressure more evenly. From the wooden ring in which this silk netting ended, the car of the B. was attached by short ropes. From the experimental flights with Montgolfières and Robertières much knowledge was gained, and during the next few years flights took place in a great many places. Reference has already been made to the flight of Madame Thiblé, while in the same year Lunardi made the first flight in England. Flying from London, he made a successful descent in Hertfordshire, after having been in the air for a little over two hours. In the following year, in the face of much difficulty and in spite of considerable hardships, the first cross-Channel flight was made by Blanchard and Jeffries. Blanchard had previously made a number of successful flights, being one of the first professional balloonists. This successful flight roused the envy of his fellow-balloonist, Pilâtre de Rozier, who had desired to be the first to cross the Channel himself. In order to imitate the flight

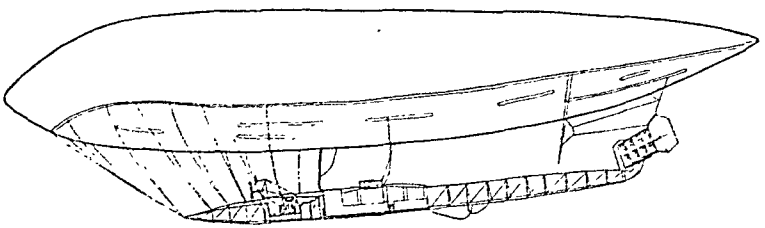
of Blanchard he constructed a B. of special type (hydrogen over hot air), which, however, came to grief in 1785, a few moments after the ascent had been made. Both Rozier and the friend who accompanied him lost their lives in the failure.

The success of the B. was soon assured, and many ascents were made during the years following the first experiments of the Montgolfièrs, and of Charles, Robert, and others. The problem which now immediately presented itself to the minds of those interested in ballooning was the construction of a B. which should not be at the mercy of the elements, and which the passengers should be able to direct. The number of suggestions made were beyond all reason, and some of them were in the highest degree foolish. The first two suggestions were for the employment of oars and sails. The former would have been successful perhaps in moving a B. along at a very slow rate; the latter, save by means of employing also a guide rope which trailed on the ground, and which therefore caused the B. to go slower than the wind, would have been completely useless. The early experiments for the production of a dirigible B. were failures; experiments were made with oars, with rudders, with sails, and by means of air-bags. It may be said that the first half of the 19th century was utterly devoid of any real success in the production of a B. which could be controlled. In 1852 we get the first dirigible whose motive power was a steam-engine which drove a propeller. This was built by Giffard. The weight of the dirigible, which was made with pointed ends, was roughly 1½ tons, and experiments with it showed that it was useless for its purpose. With his second machine, built in 1855, he was rather more successful, being able during one of his experiments to move slowly against the wind. Even this machine showed that many improvements would have to be made before it was possible to produce a machine which would be capable of being fully controlled. A third B. was planned by Giffard on a very large scale, but his third attempt was never put into execution, and although all the plans for it were made in detail, the inventor died before the construction of the machine was started. The experiments commenced by Giffard were continued in other countries, especially under the direction of De Lôme, and almost at the same time by Haenlein, who used for the first time a gas engine. This machine met with a certain amount of success, but the type of engine was too heavy, and the results of the experiments were therefore not as great as had been hoped for. The machine was an advance on the type of Giffard and Lupuy or Lôme, but on the whole was not a great success. The first real success of the dirigible type of B. was the successful flight of the airship 'La France,' under the direction of two Fr. officers, Renard and Krebs. In Aug. 1884 they were able to prove conclusively that a dirigible airship could be produced, and could be manœuvred in the face of the wind, providing that the wind was not blowing at too great a velocity. Their first successful flight lasted for about twenty-three minutes, and they covered considerably more than 5 m. These experiments, coming at the end of a long series of failures, gave renewed hope to the aeronauts, who had by this time almost concluded that the solution of dirigible flight was beyond the hopes of practical experiments. The successful flight of 'La France' caused a renewal of experiments in most of the countries of Europe. In Germany a new dirigible was made by Dr. Wolfert, and its first ascent in 1897 ended in disaster. In 1898, however, we can begin to note the first experiments of Count Zeppelin.

Since 1898 Count Zeppelin has constructed four dirigible B., all of which have met with a considerable amount of success. The first was experimented with in 1900; it made three flights, and the machine was finally abandoned. In 1906 a second attempt was made by the Count, the results, however, in the second case, not meeting with any very great success. The machine was landed safely, but was damaged by the wind during the night so considerably that it had to be broken up. The Zeppelin III. was built soon after the disaster to the second, and was a very great success. It succeeded in carrying eleven passengers for a distance of about 69 m. In the following year (1908) appeared Zeppelin IV., which made a number of successful voyages, the crowr [illegible] the journey to Mayence [illegible] the airship was unfortunately destroyed by fire. In June 1909 he also succeeded in travelling over 900 m. in thirty-eight hours, and on his arrival in Berlin was greeted with enthusiasm by the populace.

Another great name in the annals of the dirigible B. is that of Santos Dumont, a young Brazilian, who, by his fearlessness and by his repeated [illegible] in the work [illegible]le B. Alto- [illegible]irships, and

the results of these flights and the remedying of the failures went far to solve the question of aerial flight. Above all he roused the enthusiasm of France for aerial flight, and did much to attract the attention of scientists to the problem of successful flight. The Lebaudy airship was a type that also proved successful, and was practically adopted as the type by the Fr. military authorities. The Lebaudy dirigible was the first example of the semi-rigid type which has since proved itself so successful. The first Lebaudy machine, after a series of successful trips, was wrecked in Nov. 1904; but so successful had the type of machine been that immediately the brothers Lebaudy built another on a large scale, which ultimately was adopted as the parent type of the dirigibles of the Fr. army. The Fr. airship, the 'Patrie,' was built after this model, and had a long and successful career before coming to an untimely end in the Atlantic; but the Fr. nation were not disheartened by this disaster, and a number of other airships of this type have since been built. In Great Britain, the first airship was of the non-rigid type, and was almost from the beginning antiquated and useless, but since then other airships of the semi-rigid type have been built, and during the manœuvres in East Anglia during 1912 these vessels proved that they were capable of being put to good use. The three prin. types of airship have now been dealt with. The rigid, such, for example, as those built by Count Zeppelin; the non-rigid, the type which was first adopted in Great Britain; and the semi-rigid, the type of the Lebaudy machine, and also the type principally adopted in Great Britain after the ill success of her first ship.



Military ballooning.—Immediately after the first success of the Montgolfière and the Robertière type of B., it began to be recognised that the B. could be put to reasonable use during warfare. From the vantage point of the air the balloonist would be able to learn the position of the enemy, and to direct the fire of his own artillery. This advantage seems to have first struck the Fr., and during the early period of the revolutionary wars, we find that two B. corps were organised by the Fr. Their success was not very great, but it was of some value during the battle of Fleurus, 1794, and annoyed the enemy to such an extent that, at least by the Austrians, balloonists were treated in the same manner as spies. But there were tremendous difficulties in the way of the B. corps, and in 1798, on his return from Egypt, Napoleon put an end to the existence of the French B. corps. During the 19th century we find that a great many attempts were made to revive the use of the B. as a necessary adjunct to the army, but until after the Franco-Prussian War (1870-1), we cannot say with any degree of confidence that the experiments were justified by their results. During the early part of the 19th century an attempt was made to foster the use of military Bs. in Russia, but the experiment was too costly, and was given up. During the many wars and revolutions of that century attempts were made to revive the use of the military B. The insurgents in Italy made use of them; during the Civil War in America use was made of them; and even in the wars of the republics of S. America Bs. were used at least for reconnoitring purposes. In most of the armies of the Great Powers experiments were made with Bs., and in France, Napoleon III. tried to revive the B. corps, which had been done away with by his great predecessor. In Great Britain many military experiments were tried, but no attempt was made actually to form a B. corps until after 1870. Both the Fr. and the Ger. military authorities tried to utilise Bs. during the Franco-Prussian War. The Ger. attempts were almost completely a failure; the Fr. attempts to use the Bs. for military purposes exclusively also to a large extent failed. So little information was gained that the military authorities ultimately sold their B. to the postal dept. On the other hand, passengers

and letters were conveyed out of the besieged tn. of Paris in comparative safety by means of a B., and altogether, out of the sixty-six Bs. that left Paris during the period of the siege, at least fifty-nine of them arrived safely at their destination. The B. work of the siege of Paris was both interesting and useful, and served the double purpose of helping the Fr. to take communications out of the besieged city and also gave useful experience of the practical value of the B. during a period of war. After the war of 1870-1, B. corps were formed in practically every army, and the experience gained during that war went far in helping in the organisation of the B. corps throughout the world. One natural result of the war was the invention of a gun which could be used for firing at Bs., and this in turn led to additional experience later in times of peace as to the exact manner in which Bs. could best be disabled in time of war, and to what extent rifle and cannon fire would injure them. Further, the advantage of a B. service, even if useless as far as actual military tactics were concerned, was shown in the organisation of resistance to the Germans by Gambetta, after his escape from Paris by means of a B. Immediately after the close of the Franco-Prussian War use was made of the experience gained during that war to put B. corps upon a firm and satisfactory basis. The Fr. immediately commenced the work of organising B. corps which would be of value during actual warfare: they realised that in any future war they must be prepared for active operations by means of Bs., and they organised the B. corps so that to each army corps could be attached a B. corps which would be self-contained and self-reliant. To each corps were attached wagons for the carrying of tools and appliances and for carrying also the actual B., while further gas waggons were attached which would give the corps a constant supply. In Germany the first B. corps was formed in 1884, and has since that time continued to be supplemented and strengthened, so that at the present day the B. corps of Germany are of very considerable value, and ranks amongst the finest in Europe. In Great Britain a B. corps was first founded in 1879, and during many of the wars which England fought after that period the B. corps did valuable work. Mention may here be made especially of their work during the S. African War, where, although during the siege of Ladysmith the B. corps, owing to the lack of supplies, could not do any work, afterwards was able to render great and valuable services to the troops in the field, and especially during the events which led to the surrender of Cronje. America also used B. in 1898, during her war with Spain, and B. corps have also been formed in Austria and Russia. The types of B. used may be divided into two classes—the free B., the captive B., and in this category, although not strictly a B., we may add the kite. Of these the captive B. is probably of the greatest actual service, since by use of it observations may be made of the movements of the enemy, and above all the fire of the guns of the artillery may be actually directed from such a B. The free B. would be of perhaps greater service if it were possible to place the same reliance in it as in the captive B. The free B. has the advantage of being able to follow the movements of an army which is moving from place to place, and is also of great value in reconnoitring the position of the enemy, and of gaining information of the fortifications and strength of the towns of the enemy. The man-lifting kite has recently been the subject of many experiments, and from these experiments promises, with the captive B., to be of the greatest advantage to the army, especially from the point of observation and direction of artillery fire. The man-lifting kite can also be used with advantage during naval operations, and promises to be of the utmost value, since it is more easily carried by warships than the captive B. For the use of dirigibles in warfare, *see* AERONAUTICS.

The balloon and science.—The use of the B. as a means of examining the phenomena of the atmosphere was first made soon after the earliest successful ascents had been made by the Montgolfiers and by Charles. Charles, as a matter of fact, made scientific observations during his first voyages, but the first ascent made wholly in the interests of science was made by Jeffries in 1784. From his observations the B. rose to a height of 9000 ft., and the temp., which was about 50° in London, fell to 29° F. During the first half of the 19th century many ascents were made, but until the experiments of Glaisher begin we may conclude that the results obtained were not of outstanding importance. Glaisher, however, made altogether some twenty-eight ascents for scientific purposes, and his results were the best which were obtained for some very considerable time. The results of his experiments may be found in the reports of the British Association. The chief questions which he sought by experiment to determine were: the temp. of the atmosphere, the amount of moisture contained in

it at the higher levels, the determination of the old point—the suitability of the higher levels for human habitation (this had reference principally to the mountains of India), the determination of the electrical properties of the atmosphere, the properties of the oxygen of the atmosphere, the collection of samples of the air at various levels, the constitution and the height of the clouds, the velocity and direction of the breezes; later especially, special instruments were invented in order that the information gathered during these scientific ascents should be accurate, and much valuable information was gained by the use of these instruments during the numerous ascents. The work has been confined chiefly to meteorology, but much valuable astronomical work has been done also. The phenomena attendant on the eclipse of the sun have been observed from a B., and interesting information concerning shooting stars has been gathered also. The experiments commenced by Glaisher have been continued by distinguished scientists in almost every country in the world, and the information which has been gathered has been of vital importance to the *science of meteorology*. The B. has also been used for attempts to reach the North Pole, the most famous of which was the unfortunate attempt of Andrée; Andrée's expedition never again being heard of. The longest B. voyage proposed was that of Wise in 1873, who proposed to cross the Atlantic Ocean in a B. specially constructed for him by the New York *Daily Graphic*. The voyage was never commenced, since the B. was rendered useless while being filled. Since then Wellman attempted the same feat. Starting on Oct. 15, 1910, in a specially constructed dirigible, he abandoned the attempt in mid-ocean after flying and drifting 850 m. Two voyages of over 1000 m. are on record, the first being that of Wise in 1859, from St. Louis to Henderson, New York, which covered a distance of 1120 m.; the other the voyage of the Count Henry de la Vaulx, who, starting from Paris, reached the town of Korostichéff in Russia, thus covering a distance of nearly 1200 miles.

Ballot (It. *ballotta*, diminutive of *balla*, a ball), originally, the little ball used for secret voting; hence 'voting by ballot' is a term applied to the practice of secret voting. Secret voting was practised in Greece and Rome by means of balls, marked stones, shells, and tickets, in cases of ostracism, at criminal trials, and in Rome at the election of candidates to a public office. Secret voting at elections of members of parliament was advocated by Eng. reformers in the early 19th century; it was included in the draft of the Reform Bill of 1832, a bill on the subject having been introduced by O'Connell in 1830. It was first used in 1870, in connection with the London School Board elections, and two years later, by Forster's Ballot Act, it was introduced into all parl. and municipal elections. The practice is now in force at elections in all countries where a constitutional gov. prevails. Voting by means of coloured balls for the admission or rejection of new members is common in most clubs.

Ballot, Buys, *see* BUYS-BALLOT, CHRISTOPH.

Ballot, Charles (1818-85), a Fr. lawyer and publicist. He founded the *Revue pratique du droit français*, contributed to *Le Siècle*, and ed. *Le Droit*. He was also appointed solicitor-general, of the court of Paris, and vice-president of the council of state.

Ballot, Marie Paul Victor (1855), a Fr. colonial administrator. He was appointed commander-in-chief of Senegal, 1878; of the settlements around the Gulf of Benin, 1887; and organised the French explorations of the interior of Africa as far as the Niger.

Ballota, a genus of Labiatæ common to Europe. *B. nigra* is the fœtid horehound, a British weed. The ordinary horehound belongs to the same order but genus *Marrubium*.

Ballu, Albert (1849), a Fr. architect, son of Théodore Ballu. He was appointed diocesan architect of Algers, 1885, and received a gold medal from the exhibition of 1889. Amongst the works which he has undertaken are: the court of justice of Charleroi, the tower of the cathedral of Aix, and the restoration of the churches of Esnandes (Charente-Inférieure), of Notre Dame de Lambelle (Côtes-du-Nord), and of Saint Florent in Corsica.

Bally, Victor (1775-1866), a Fr. physician. He took part in the expedition of Saint-Domingue, joined sev. army medical corps, and did much work when the yellow fever was raging at Barcelona, 1821. He was the author of several medical treatises.

Ballycastle, a small seaport in the N. of co. Antrim, Ireland, opposite Rathlin Is. There is a good pier and harbour. The castle was built by the Earl of Antrim in the reign of James I. Pop. (1901) 1481.

Ballyclare, a market tn. Ireland, co. Antrim, 9 m. E.N.E. of Antrim, on the Belfast and Northern Counties Railway. It is chiefly noted for its paper mills. Pop. about 1600.

Bally Island, or Little Java, *see* BALI.

Ballymena, a tn. in co. Antrim,

Ireland, on the Braid. It is an important railway centre, on the Belfast and Northern Counties Railway. The linen manufs. were introduced c. 1733, and are an important feature of the town. The agric. and iron-mining industries are also in a flourishing condition. The town was taken by the insurgents in 1798, but was not held for long. Pop. (1901) 10,886.

Ballymoney, a tn. in co. Antrim, Ireland. Brewing, distilling, and tanning are carried on, and linen, soap, candles, and tobacco are manufactured. Pop. (1901) 2952.

Ballymote, a tn. in the co. of Sligo, Ireland. It flourishes as a mrkt. tn., and has considerable agric. trade besides carriage works. In 1300 Richard de Burgh built a castle here whose remains are still standing, and it formed the site of disturbances in 1641 and 1642. There are also the ruins of a Franciscan foundation which are approximated to the 13th century. The fame of its learning spread for some considerable distance at that time. The erudite monks left a literary monument in the form of the B. book, a manuscript now in the possession of the Royal Irish Academy. It is a miscellaneous collection of prose and verse, written in Gaelic, and compiled about 1391. There are some translations of Latin romances, and the rest is of historical and genealogical interest. The book was once in the possession of the O'Connel family, who bought it for 140 cows. A facsimile reprint was issued in 1887, edited by Professor Atkinson. Pop. (1901) 997.

Ballynahinch, a tn. in the co. of Down, Ireland. It has a large market trade, and is situated 12 m. to the S. of Antrim. Its pop. is approximately 1600.

Ballyshannon, a seaport of Donegal co., Ireland, at the mouth of the Erne. Salmon fishing is extensively carried on at a waterfall in the Erne, where the leaping of the salmon assists their capture. Owing to a bar the harbour is only available for small craft. Remains exist of a castle of the O'Donnells where the English in 1597 were defeated. Pop. (1901) 2359.

Balm, or *Melissa officinalis*, is a species of Labiatæ found in Europe and Western Asia, and is frequently cultivated in English and American gardens. It has an upright stem, opposite and alternate leaves which are toothed and ovate, and the ordinary nettle-shaped flowers of the order, of a faint yellow or a white colour. The leaves are used in medicine for their tonic and stimulant properties, but they are not of very great value. Bastard B., or *Melittis Melissophyllum*, is a single species of its genus, and is found in Europe; it also belongs to the Labiatæ.

Balm of Gilead, or **Balsam**, a species of Burseraceæ, native to tropical Asia and Africa. It is used extensively in oriental countries for its sweet scent and medicinal properties. It is referred to in the O.T. and by many old writers who affirm its power to heal all diseases.

Balmaceda, José Manuel (1838-91), a politician, w[illegible] He was made [illegible] of Chili, and a Liberal party. He did much work for the development of public instruction and for the army and navy. He also promoted the construction of railways.

Balmain, a shipbuilding suburb of Sydney, New S. Wales; pop. about 30,000.

Balme, Col de, a mt. pass situated between Mts. Blanc and Dent du Midi. It is traversed by the road from Martigny to Chamonix. Its highest point is 7200 ft. above sea-level.

Balmerino, Barons, *see* ELPHINSTONE.

Balmerino, James Elphinstone, first Baron (1553-1612), Scottish politician. Under James VI. he was appointed judge and royal secretary. He was made Lord B. in 1604. He was implicated in a letter addressed to the pope, which aroused that dignitary's wrath. After a short incarceration he died.

Balmés, or **Balmez, Jaime Lucio** (1810-48), Spanish publicist and philosophical writer, was b. at Vich in Catalonia. He proved himself an ardent and eloquent defender of the monarchical system and founded a political paper of a clerical and monarchical character in Madrid in 1844, calling it *El Pensamiento de la Nacion*. His *Filosofia fundamental* (1848) has been translated into English.

Balmoral Castle, a residence of the British sovereign in Aberdeenshire, Scotland. It is used in a private capacity. It is situated on the r. b. of the Dee, which at this point is crossed by a suspension bridge. The Prince Consort acquired it from Sir Robert Gordon and gave it to Queen Victoria together with the estate attached. It is built in granite and has an eastern tower 100 ft. high, which commands a magnificent view.

Balnaves, Henry (d. 1579), of Halhill, a Scottish reformer, was born of poor parents in Kirkcaldy, Fife, and studied at St. Andrews University and at a free school at Cologne. He acted for some time as a procurator in the courts of St. Andrews and then removed to Edinburgh, where in 1538 James V. made him a lord of session. On the accession of Mary (1543) B.

was promoted to the office of secretary of state, and was instrumental in getting the Holy Scriptures translated into the Scots vulgar tongue. He was confined for six months in the castle at Blackness for his aggressive Protestantism. In 1546 he joined the murderers of Cardinal Beaton in the castle of St. Andrews. In the following year he was captured by the Fr. and was thrust into the capital of Rouen as a prisoner of war. In 1554, when the dowager queen, Mary of Guise, became regent of Scotland, B. was released and his forfeiture rescinded. On his return to Scotland he took an active part on the side of the Lords of the Congregation, and in 1563 was appointed a lord of session and was chosen as one of the commissioners to revise the *Book of Discipline*. During his imprisonment he wrote a treatise on justification, which was pub., with a preface by Knox, under the title of *A Confession of Faith*. *See* M'Crie's *Life of John Knox* (new ed. 1889).

Balneology and Balneotherapeutics. *Balneology* is the science of baths and their effects upon the system. Baths act more by modifying temp. than by skin absorption. The *cold bath* (45°-66° F.) causes a contraction of the vessels of the skin and consequently drives the blood into the internal organs, where the resulting dilatation causes an exhilarating after-effect if the immersion be of short duration. The cold bath is thus valuable as a tonic. The *tepid bath* (85°-90°) is of value in fevers through actual heat abstraction. Between 93° and 95° baths are at the point of thermal indifference; they do not change the movement of the blood-stream and have a sedative effect on the nervous system. Baths of higher temps. promote circulation in the surface blood-vessels, and the *hot bath* (103°-108°) operates as a powerful stimulant, and is used in dropsies, catarrh, kidney diseases, etc., to increase the absorption of morbid products. If the immersion be prolonged there may be weakness of the heart with the possibility of fainting. The *Turkish bath* is a hot-air bath where the patient passes through compartments ranging in temp. from 100° to 200° F. It is used for promoting perspiration, and in cases of catarrh, neuralgia, and rheumatism. It is deleterious in fatty degeneration of the heart. The *Russian bath* is a vapour-bath in which steam is generated by throwing water on heated mineral or metallic surfaces; it is of value in rheumatism. The *douche* is a bath where water is forced by considerable pressure upon the surface of the body; it is used in insomnia and the coma of alcohol or sunstroke. The *shower-bath* is a douche where water is forced against the body from a nozzle with numerous perforations; it is used as a general tonic.

There are also special forms of bath where the body is immersed in peat, mud, slime, pine-leaves, herbs, brine, sand, bran, malt, tan, glue, milk, soap, acid, mustard, etc. Air-baths are dealt with in *Aerotherapeutics*, and electric baths in *Electrotherapeutics*.

Balneotherapeutics is a term generally restricted in application to treatment at *spas*, where patients systematically drink and bathe in water naturally mineralised, or artificially modified at the places where the springs emerge from the earth. The beneficial results of spa treatment in many types of disease are undeniable, but there is some difficulty in apportioning the credit among the various curative factors in such treatment. The usually favourable climate, the submission of the patient to a régime that would probably be relaxed at home, the presence of physicians with special experience, the provision of specially appropriate appliances and organisation, and the combination of regular exercise in a good atmosphere with systematic medical treatment, all contribute in varying measures to the well-being of the patient. As to the waters themselves, it is undoubtedly true that many of them lose their properties when bottled and exported, and cannot be artificially prepared so as to produce the same conditions, or contain such subtle ingredients that their composition is not wholly known. Gautier has suggested that the warm mineral springs consist of water which is formed by the combination of hydrogen distilled from granitic rocks at great depths with oxygen derived from metallic oxides also found there, thus producing what he calls nascent or virgin water. Many waters also contain radium emanation, which has a therapeutic value in certain morbid conditions. The bubbles of carbonic acid gas, which have such an exhilarating effect on the skin, cannot be exactly reproduced in baths artificially charged with carbonic acid.

Spa treatment is suitable in the sub-acute or chronic stage of disease, where the patient has a good supply of reserve force. Acute cases, or those tending to a fatal issue at an early period, should not be recommended; serious visceral disease, advanced arterio-sclerosis, serious mental or nervous depression are also unsuitable, whilst children and old people should have recourse to climatic influences only. In any case, the patient should be reconciled to separation

from all business and domestic entanglements which are liable to occasion worry.

The chief object of spa treatment is to promote excretion by way of the kidneys, bowels, and skin. For elimination by the kidneys the alkaline waters at Vichy, Neuenahr, Vittel, Contrexéville, Wildungen, Evian, and Aix-les-Bains are suitable. For elimination by the bowels waters containing sodium sulphate are useful, as at Marienbad, Karlsbad, Brides-les-Bains, and Cheltenham. Arthritic ailments are best suited by Aix-les-Bains, Bath, Droitwich, Harrogate, and Buxton, but it must be remembered that gout, rheumatism, and rheumatoid arthritis are to be considered in connection with the associated constitutional condition before making a choice of a spa. Nervous diseases are specially provided for at Oeynhausen, Schlangenbad, and Church Stretton. Colitis is a leading speciality at Plombières and Châtel-Guyon. Primary anæmias are treated at Schwalbach, Spa, and St. Moritz, whilst for secondary anæmias Royat, La Bourboule, Uriage, Harrogate, and Llandrindod are suitable. Marienbad is specially recommended for the systematic treatment of obesity. Diabetic patients will secure experienced treatment at Karlsbad, Brides, Neuenahr, Vichy, Vittel, Royat, Buxton, Gastein, Evian, St. Moritz, and other spas. Phlebites and varicose veins are specialised in at Bagnoles-de-l'Orne. Luchon and Schinznach have a good reputation for the cure of skin diseases, and Cauteretz attracts sufferers from throat maladies.

Balrampur, a tn. in British India near the Tapti. Its rajah was loyal during the Mutiny. Litigation on his death threw the state into chancery, the revenue of which is £46,000. Pop. (1901) 16,723.

Balsam (Gk. βάλσαμος, balsam-tree), a name given in medicine to a great many resins and oils taken from plants of many different kinds, but given in particular to B. of Peru and of Tolu. These two varieties come from leguminous plants, the first species being known as *Myroxylon peruiferum*, the second as *M. toluiferum*. Liquidamber, a balsamic product of *Liquidamber styraciflua*, is sometimes called white B. of Peru. B. of Copaiba is also obtained from many varieties of the genus *Copaifera*. Bs. have a pleasant fragrance which renders them of service in making confectionery and perfumes; they also have tonic and stimulant properties.

Balsam, or *Impatiens*, is a genus of Geraniaceæ which is native to India and Japan. The plants are generally herbaceous annuals with white or red flowers. *I. balsamina*, found in the E. Indies, is a beautiful plant cultivated in gardens and conservatories in England; *I. nolime-tangere*, yellow B. or touch-me-not, is found in Europe, and often in Britain. If the ripe capsule of the flower be touched it immediately dehisces and scatters its seed.

Balsamina, another name of the genus *Impatiens* which belongs to the order Balsaminaceæ. The former is a name given by Tournefort, the latter by Linnæus.

Balsaminaceæ is an order of Dicotyledons which contains only two genera, of which *Impatiens* is the chief. It has numerous species of herbs which are cosmopolitan and are remarkable for the elastic force with which the valves of the capsular fruit contract and eject the seeds. The flowers are regular, zygomorphic, have 5 petaloid sepals, 5 petals, 5 stamens, and 5 carpels which are united, superior, and contain numerous ovules.

Balsamo, Giuseppe, *see* CAGLIOSTRO.

Balsamodendron, or **Commiphora**, is a genus of Burseraceæ which grow in tropical Asia and Africa. *B.* (or *C.*) *Myrrha* yields myrrh, which exudes as a resin from the bark and becomes hard by exposure to the air: it has a bitter taste and peculiar odour, and is used in the manuf. of incense and some medicines. *B.* (or *C.*) *opobalsamum* produces the expensive Balm of Gilead, an oleo-resin which is highly prized in the East.

Balsham, Hugh de (*d.* 1286), succeeded William de Kilkenny as Bishop of Ely, 1256. In 1280 he obtained a charter to introduce 'studious scholars' into his hospital of St. John, Cambridge, in place of the secular brethren. In 1284 he founded Peterhouse, Cambridge, for his own pupils.

Balta, a tn. in the Russian gov. of Pondolia. It is situated between the Dniester and the Bug. It has an extensive trade in cattle, horses, and grain. Two fairs are held there annually. Among its industries are tallow-melting, soap-boiling, tile-making, and brewing. A large part of the pop. are Jews; pop. 23,393.

Balta, Jose (assassinated 1872), Peruvian statesman. He helped General Canseco to overthrow Pezet, and became one of Canseco's ministers, 1865. Prado defeated Canseco, but was himself ultimately overthrown by B., who then became president of Peru, 1867-71. He ruled well, and favoured public works, but was assassinated by Marcelino Gutierez, July, 1872.

Baltadji, Mohammed (*d.* 1712),

Turkish statesman, became grand vizier under Ahmed III. In 1710 he gained a decisive victory over the Russians, but was induced by the Empress Catherine to sign the treaty of Falezi renouncing his advantages in the battle, which greatly incensed Charles XII. of Sweden who had aided him. His death took place at Lemnos.

Baltard, Louis Pierre (1764-1846), a Fr. architect, engraver, painter, and author. He at first became an engraver, then went to Italy where he served as an architect, but owing to the Revolution he returned to Paris and entered the army. He afterwards became professor of architecture at the polytechnic, and did much work as an architect in Paris, and built the chapels of Sainte-Pélagie and Saint-Lazare, and the court of justice at Lyons. His engravings were very numerous.

Baltard, Victor (1805-74), a French architect, son of Louis Pierre. As director of architectural works at Paris and La Seine he built sev. public buildings, and he also restored the churches of St. Germain des Prés, St. Eustache, St. Severin, and St. Etienne du Mont. Of his publications, illustrated with his own designs, the chief are: *Monographie de la villa Médicis à Rome*, 1847; *Monographie des Halles centrales;* and *Les Peintures et arabesques de l'ancienne galerie de Diane à Fontainebleau.*

Baltazarini, or Baltagerini (*fl.* 16th century), It. musician, first violinist of his time and founder of the modern ballet, was first *valet-de-chambre* to Catherine de Medici. He introduced It. dances to Paris, and by his royal mistress was called Beaujoyeulx.

Balthazar, or Balthasar, the Gk. form of the name Belshazzar (*q.v.*).

Baltic, or Baltiiski Port, is a seaport of Russia on the Gulf of Finland, and marks the end of the Baltic R.; pop. 900.

Baltic, Battle of the, was a great sea-fight which took place off Copenhagen on April 2, 1801. In this battle Sir Hyde Parker and Nelson destroyed the Danish fleet.

Baltic Provinces, region lying on the Gulf of Finland and the Baltic Sea, including the three Russian governments of Courland, Livonia, and Esthonia. The term is generally used to include also Petersburg and Finland. The bulk of the pop. consists of Lettish and Esthonian races, the latter being a branch of the Finns, while there is a considerable admixture of Germans, especially in the large towns and among the higher classes. The number of Russians is still fairly small. Excepting Courland, which was a dependency of Poland, all the B. P. once belonged to Sweden. The foundation of St. Petersburg in 1703 first gave Russia a secure footing on the Baltic, and the Swedish provinces were ceded to her soon after. Courland did not come into her possession until 1795. Strenuous attempts have been made to Russianise the B. P., and to convert their inhabitants to the Russian Church, but have not been very successful. Commerce in the Baltic is good.

Baltic Sea, a sea between 54° and 66° N. lat. and 9° and 30° E. long. It is surrounded by the dominions of Sweden, Russia, Germany, and Denmark. It is 960 m. long and 400 m. broad. It has 5000 m. of coast-line. A channel connects it to the North Sea. The western portion of this channel is called the Skaggerack, while the remainder is called the Kattegat. Islands fill the southern extremity of the Kattegat, and communication is continued by narrow straights called the Sound, the Great Belt, and Little Belt. Its total area is 166,397 sq. m. The separating factor between the B. and the North Sea is a plateau upon which the is. Zealand, Funen, and Laaland are situated. Its depth has been computed to be 36 ft., which falls considerably lower than that of any other inlet of the sea of similar character. The bed of the B. S. in the deeper parts is generally of soft brown or grey mud, or else of hard clay. Near the low coasts and on the shallower banks fine sand with small pebbles are seen.

Its navigation is rendered dangerous by shallowness, narrowness, and sudden changes of wind followed quickly by tempestuous storms. It runs eastward into three gulfs, Gulf of Bothnia, the northernmost, Gulf of Finland, and Gulf of Riga. There is not such a quantity of salt in the B. as in other oceans, and the water therefore is clearer on that account. From three to five months of the year access through the sea is hindered by ice, but the whole surface is seldom frozen entirely, though records of that event have been estab. in the years 1658 and 1809. It possesses the characteristic of all inland seas that it is little affected by tides. Nevertheless a perceptible rise and subsequent fall of its waters takes place. This, however, is due more to the variations in the water-bulk of its rivers than to any tidal circumstances. Of the rivs. that discharge their waters into this sea there are 250, resulting in a drainage of almost one-fifth of the area of Europe. The most important of these are the Oder, Vistula, Niemen, Dwina

Narva, Neva, while the chief of the is. are Zealand, Funen, Bornholm, Stamsöe, and Laaland (Denmark); Gottland, Oland, and Hveen (Sweden); the Aland Is. (Russia), and Rügen (Prussia). The prin. exports from its bordering countries are timber, furs, tallow, and grain. Amber is cast upon its shores in stormy weather. The canals connecting the B. S. with the North Sea are the Kiel, which cost £8,000,000, and which has proved an immense advantage to Germany; the Eider Canal and the Gotha Canal. The chief harbours in the B. are Copenhagen (Denmark); Kiel, Lubeck, Stralsund, Stettin, Danzig, Konigsberg, and Memel (Germany); Riga, Narva, Kronstadt, and Svcaborg (Russia); and Stockholm and Karlskrona (Sweden).

Baltimore, a port and the largest city of Maryland, U.S.A. It is, as regards pop., the seventh largest city of the United States, and is situated on the northern bank of the R. Patapsco, an inlet from Chesapeake Bay. It is 250 m. distant from the ocean by canal. Its environment is pleasing, and its site is of varied alts. In the arrangement of its streets it differs from most of American cities in their strict regularity. It owes a great deal of its importance to its safe harbour, whose minimum depth is 24 ft. Many railways converge at B. and a great trade in bread-stuffs is carried on, while among further articles of export are tobacco, provisions, coal, cotton, naval stores, canned fruit, and oysters. The chief articles imported are guano, coffee, other tropical products, fertilisers, iron, steel, tin-plate, and chemicals. Besides its great shipping trade, B. has extensive manufs. which include cotton and woollen goods, flour, cigars, and other forms of tobacco, beer, glassware, boots, iron and steel, machinery, bric
ing, pianos, and
of oysters form
industries of B., and many thousands of vessels are engaged in their quest. The splendid appearance of many of its buildings has made additional fame for the tn., among which buildings the most notable are the chamber of commerce, the Rom. Catholic cathedral, the custom-house, the Maryland Institute, and the Peabody Institute.

There are five noteworthy public monuments, the chief being that of Washington, a column 210 ft. high. The fineness of these erections have caused B. to be called the 'monumental city.' The most famous of its many beautiful parks is the Druids' Hill Park of nearly 700 acres in extent. There are approximately 200 churches, conspicuous among which are the Rom. Catholic, Protestant Episcopal, and Methodist. One of the first seats of learning in the country is the John Hopkins University, founded by a philanthropist of the name. It was opened in 1876. Other educational centres are the B. city college, the academy of science, the law school, St. Mary's University, and Loyola College. Among the many libraries the largest is the Peabody Institute, 1876.

As a social centre and a tn. famous for its enthusiasm for art, B. is specially to be noted. It has the see of a Rom. Catholic archbishop, who acts as primate of U.S.A. Dr. John Carrol was the first archbishop. The native r ment
of Ger. Irish
and Fr. days
when B. was a colony, the Puritans and Scotch-Irish Presbyterians were in great numbers. The city was founded in
who estab.
the wars o
scene of many engagements. Its pop. in 1900 was 508,597.

Baltimore, George Calvert, first Baron (1580-1632), *Eng. politician.* He was a native of Yorkshire, and was educated at Trinity College, Oxford. He became secretary to Robert Cecil, afterwards Earl of Salisbury. He helped James I. in a discourse against
connected with the growth of our colonial empire, in which development he was much interested. He estab. a settlement at Newfoundland in 1621, and attempted a similar settlement in Virginia, but his refusal to sign oaths of allegiance prevented the execution of his project. He wrote *An Answer to Tom Tell-Troth*, and many of his letters are found in the Clarendon State Papers.

Baltimore and Ohio Railway, *see* UNITED STATES OF AMERICA.

Baltimore Bird, or Oriole (*Icterus Baltimorii*). It is very common all over N. America, and is something like a finch, measuring about 7 in. from the tip of its long, sharp, beak to the end of its rounded tail. The beak is conical and longer than the head, and the wings long and pointed. The males come N. early in May, preceding the females by a few days. They choose a spot preferably near houses, and build a beautiful hanging nest, from 6 to 7 in. long, in a tulip tree or pea-vine, taking their materials

from moss patches, cattle hairs, or fibres. Their plumage, especially of the males, is very gay, glossy black, orange, and vermilion. Orange and vermilion were the colours of the livery of Lord Baltimore, whence the name. It is also called 'fire-bird' from its bright plumage, and 'hang-nest' from its method of building. The B. B. has a strong and sweet song particularly pleasing during its mating season, and is gregarious in habit. Although they do much damage among the fruit, they rid the orchards of such insects as the canker-worm and tent-caterpillar. *See* Baird, Brewer, and Ridgway, *N. American Birds*.

Baltinglass, a market tn., 30 m. W. by S. from Wicklow, is a small and ill-built town. Pop. about 2000.

Baltistan, otherwise Little Tibet, a mountainous region below the Kara-Korum Mts. and the Himalayas. Its mean elevation is 11,000 ft. The Upper Indus flows through the region which contains a high peak, nameless but for a mark, K^2. Its height is 28,278 ft., and hence it is the second highest mt. on the globe. The inhab. are Mongolese, and politically it forms part of Kashmir.

Baltjik, a Bulgarian seaport on the Black Sea. It is situated 20 m. N.E. of Varna. The ruins of Tomi, the scene of Ovid's exile, are near it. Its pop. is 4000.

Baltzer, Edward (1814-87), a Ger. minister who founded a free Protestant community at Nordhausen, was a member of the National Assembly at Frankfort, and estab. a society in 1868 to further vegetarianism. He was the author of many theological and sociological works, and of a book on vegetarian cooking.

Baluba, a large negroid tribe of the Congo Free State, living between the Kassai and Lubilash rivers.

Baluchistan (Beluchistan), a country in S. Asia. Its boundaries are: on the N., Afghanistan; on the E., Sind; on the S., the Arabian Sea; and on the W., Kerman, a prov. of Persia. There is no permanent fixity in the frontier between B. and Afghanistan, though its Indian boundaries are more clearly marked. It has a coast-line of 500 m. The ancient dominion of Padro-is bears a certain relation to the present B., whose extent does not equal exactly that of the preceding kingdom, which extended to the Indus. Approximately, so far as may be estimated from the vague line of demarcation on the Afghan borders, the area is 132,000 sq. m. Its pop. in 1901 was 914,531. Much of the country is still unknown save to a small number of explorers, and any thorough knowledge possessed of portions of it has only been gathered since 1810. Formerly it formed a part of Persia, though its modern relations with India are more pronounced, especially since the establishment of British jurisdiction over Sind and Multan. Its surface is mountainous, particularly in the northern region. Here there is an elevation of 12,000 ft. formed by the spurs of the Sulimen Mts. In the S. the direction of the mt. systems runs from E. to W., while northwards the mts. are stretched across from N. to S. The chief routes are the valleys formed by the parallel mt. chains of the S. The only settled thoroughfares are those to Quetta and Kelát through the Bolan and Mula passes respectively. Some of the valleys are as high as 5700 ft. at their bottom, and Kelát, the cap., on the slope of one of these, is itself 6748 ft. high. Large tracts of the country are formed of impassable deserts, subject to fierce sandstorms in summer and equally formidable cold winds in winter. The rivers are dependent upon the heavy rains, and when these fail are soon exhausted. This desolate character is chiefly true of the W. region. The temp. varies between suddenly changing extremes. In March the thermometer has registered actually 125° F. at Kelát, in spite of excessive cold in the previous month that has fallen many degrees below zero. Necessarily, therefore, pasturage is very scarce, and cattle are consequently few in number. Sheep and goats are numerous, however. The nature of most of the soil makes the camel the most useful beast of burden, while in the N.W. horses bearing traces of Arab pedigree are reared.

Among the wild animals are the tiger, leopard, wolf, hyena, ape, while fish are caught in large numbers off the coasts. These regions that enjoy sufficient rainfall are fairly productive, among the crops being tobacco, rice, sugar, and cotton; wheat, barley, madder, maize, and pulse flourish in the more elevated districts. Trees are scarce, those found at all growing mostly upon the mt. slopes. They include the olive and peach, while parts of the desert furnish brushwood. Fruits are many, and large quantities are produced in the gardens; the Mekran dist. specialises in date growing.

Of the mineral wealth of B., gold, silver, lead, antimony, iron, copper, sulphur, alum, and sal-ammoniac are among the most plentiful deposits. In 1887 a valuable petroleum well was discovered in the N.

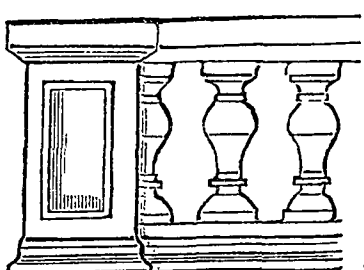
Kelát is the only tn., and is the cap. It has about 14,000 inhab. A general

character of wretchedness marks the dwellings of the town, a trait which also is observed in the small fishing villages of the S. Some roadsteads in a somewhat better condition are found on the sandy parts of the coast, among them being Soumiani Bay, Homara, and Gwadar. The natives are formed of Brahui and Baluchis, the former being the dominant race.

The dominion is ruled by the Khan of Kelát, who in 1839 was punished by the British for treachery. British right to occupy Quetta was secured in 1877, and since 1893 its administration has been transferred to a British agent of the Nushki district. *See* Bellew. *From the Indus to the Tigris*, 1874, and works on Baluchistan by Hughes (1877) and Oliver (1890).

Balue, Jean de la (1421-91), Fr. cardinal and minister of Louis XI. He was first introduced to Louis by Charles de Melun, and he became chaplain to the king, comptroller of finances, secretary of state, bishop of Evreux, 1464; bishop of Angers, 1467; and cardinal 1483. He intrigued with the Duke of Burgundy, Charles le Téméraire, against Louis, for which he was imprisoned in an iron cage in the castle of Onzain 1469. He was, however, released in 1480, and went to Rome.

Baluster, or Banister (from Lat. *balaustium*, the flower of the pomegranate), the name given to pillars or shafts supporting a cornice or



BALUSTER

coping. The pear-shaped swelling at the lower end of the pillar accounts for the origin of the name.

Balustrade, is the range of equidistant balusters together with the cornice or coping they support. They are used as parapets or to enclose stairs, and may be decorated with various devices.

Baluze, Etienne (1630-1718), Fr. historian. He served as bursar at St. Martial College, Toulouse, 1646-54, and during that time his work *Antifrizonius* was pub. He held various other positions, and in 1707 was appointed inspector of the Royal College of France. His chief works are: *Capitularia Regum Francorum*, 1677; *Miscellanea*, 1678-1715; *Nova Collectio Conciliorum*, 1683; *Vitæ Paparum Avenionensium*, 1693; *Historiæ Tutelensis Libri III.*, 1717. On account of his *Histoire généalogique de la maison d'Auvergne*, 1708, B. was exiled in 1710, but was recalled to Paris in 1713.

Balzac, Honoré de (1799-1850), a Fr. novelist, born at Tours, of a well-to-do bourgeois family. From 1806 to 1813 he attended the Collège de Vendôme, and for the following three years the Collège de Tours, but he showed no aptitude for study, though he must have read widely in his early youth. Much of his school life is reflected in the pages of *Louis Lambert*, 1832. His father put him to study law at Sorbonne, but Balzac kicked over the traces, refused to practice, and in 1819 went to Paris, perfectly confident of his vocation. From 1820 to 1829 he was an apprentice to his trade—trying his hand at tragedy and at novel writing, but making very little progress in either. It was a period of hard work and great privation. In 1825 he started business as a publisher, printer, and type founder—a speculation which entailed debts that harassed him almost to the end of his life. The publication of *Les Chouans* in 1829 marks the beginning of his literary career. Though it has been termed melodramatic, it is incomparably superior to his previous work, giving a brightly-coloured picture of Brittany in 1799, and containing scenes of real passion. The imitation of Scott is obvious.

From 1829 Balzac worked with fierce, untiring energy, and a fertility that almost passes belief. In twenty years he produced eighty-five novels, in addition to his dramatic attempts, articles to the newspapers, miscellaneous minor works, and a lengthy correspondence, addressed chiefly to his sister Laure and her friend Mme. Zulma Carrand. Some of his best known works may be mentioned: *Les Contes Drôlatiques*, which are written in a Rabelaisian vein, and must be classed separately from his novels; *La Maison du Chat-qui-pêlote*, 1830; *La Femme de Trente Ans*, 1831; *La Peau de Chagrin*, 1831; *Le Chef-d'œuvre inconnu*, 1831; *La Bourse*, 1832; *Eugénie Grandet*, 1833; *Les Marana*, 1833; *Père Goriot*, 1834; *Le recherche de l'absolu*, 1834; *Séraphita*, 1835; *Les Illusions Perdues*, 1843; *La Cousine Bette*, 1846.

His output, in fact, was prodigious.

He conceived the idea of uniting his various pieces into one mighty whole, under the title *La Comédie Humaine*, which should comprise all the multifarious aspects of life—*scènes de la vie parisienne, de la vie militaire, de la vie privée*, and so on. This vast scheme, of course, was not completed, and no human brain could ever have achieved it.

In Paris he made numerous friends, including Victor Hugo, Vigny, George Sand, and Lamartine. He fell in love with a Polish lady, Madame Hauska, who was his ideal to the end of his life. Though her husband died in 1840, debts and other causes prevented Balzac from marrying her till a few months before his death. He was buried in Paris on Aug. 20, 1850, the pall-bearers being Dumas, Hugo, Baroche, and Sainte-Beuve. Hugo delivered the funeral oration over his friend.

B.'s genius is undeniable. He flashed on all the little, unnoticed things the lurid light of his imagination, and therefore he has been called both a realist and a romanticist, according to the point of view of the reader. Nothing escaped his notice, and in the remorseless handling of his material he has been accused of indecently exposing the sordid, unhealthy side of life. But it cannot be doubted that his aim was moral, in the widest sense of that term. His stage is so vast, his persons so true to life, that as a creative genius he stands second to none but Shakespeare.

Balzac, Jean Louis Guez de (1597-1654), a celebrated Fr. essay-writer and stylist, *b.* at Balzac, near Angoulême. He went to Italy with Cardinal de la Valette, and was struck by the rich smoothness of the Italian style as compared with that of his own country. His writings mark the beginning of polish and elaboration, before unknown in Fr. composition. In spite of his affectations, he was regarded as a master of prose style. His *Letters* were pub. in 1624; *Le Prince*, 1631; *Discours*, 1644; *Le Barbon*, 1648; *Aristippe*. He joined the French Academy in 1634, and was a friend of Richelieu. His collected works were published in 2 vols. (1665).

Balze, Jean Etienne Paul (1815-84). Fr. artist, was *b.* at Rome, and made his début at the Salon in 1835 with a painting from Scott's *Lady of the Lake*. He was assisted by his brother, Jean Antoine Raymond (*b.* 1818), in his reproductions from Raphael, and in his mural paintings in the palace of the senate representing the great scientific, agricultural, and industrial discoveries of the 19th century. Other works are: 'La Mort de Sixte IV.' 1856; 'Le Couronnement de la Vierge,' 1859; and 'Le Triomphe de Galatée.'

Balzer, Johann (1738-99), Ger. engraver; engraved and edited at Lissa and Prague many country scenes and portraits of famous persons. Among the latter were Emperor Joseph II., Archduke Maximilian, Maria Theresa, and Wenzel Hollar. His two sons also became well-known engravers.

Balzico, Alfonso, an Italian sculptor, *b.* at Cava di Tirreni, near Salerno, 1825. He studied at the Academy of Naples and at Rome, where he executed the colossal statue of John the Baptist. 'Cleopatra,' 'The Coquette,' 'Revenge,' and 'The Tree' were executed by special request of King Victor Emmanuel. His other works include 'Massimo d'Azeglio,' 1873, and 'Duke Ferdinand of Genoa,' both at Turin, and 'Victor Emmanuel,' 1897, at Naples.

Bamanguato, or **Bamangwato**, an African tribe, of the Bantu race, inhabiting the dist. of the protectorate of Bechuanaland.

Bambarra, a country in Western Africa, in the upper valley of the Niger, bounded on the N. by the desert of Sahara. The pop., estimated at 2,000,000, is made up of negroes, Mandingoes, and Foulahs. The climate is hot and oppressive in the plains, but is comparatively cool in the mountainous region to the S.W. The rainy season lasts from June to November, and the country is visited by violent tornadoes. The minerals iron, gold, and salt are found, but not in very large quantities. The soil is very fertile, the products being rice, maize, cotton, millet, yams, watermelons, French beans, onions, and other vegetables. The tobacco and indigo plants are also cultivated. Among the trees are the pistachio, the shea-tree, from the kernel of which a kind of butter is extracted, the tamarind, and the Rhamnus lotus. Numerous animals are found in the country—cattle, sheep, horses, alligators, turtles, pelicans, egrets, teals, and Barbary ducks. The prin. tns. are Segu, Bamaku, Sansanding, and Jamina. The country has lately come under French influence.

Bamberg, a city of Upper Franconia, Bavaria, situated on the Regnitz, not far from its entrance into the Main, 33 m. N.W. of Nuremberg. There are many interesting buildings of an early date—the old castle of the former prince-bishops of B., the ruins of the castle of Altenburg, once the seat of the Count of Babenberg, and the cathedral. The last-named is a magnificent structure in the Byzan-

tine style, founded by the Emperor Henry II. in 1004. It suffered from a conflagration and was restored in 1110. There are many interesting mediæval tombs, a beautifully carved choir screen, and the crypt is a fine example of early Romanesque. The modern buildings include an art gallery, a municipal hospital, and educational and charitable institutions. The industries consist of the manuf. of gloves, leather, woollens, sugar, starch, and beer. Pop. (1905) 93,882.

Bamberger, Ludwig (1823-99), a Ger. politician and economist, born at Mainz, of Jewish parentage, studied law at Giessen, Heidelberg, and Göttingen. He took part in the revolutionary movement at the time when he was editing the *Mainzer Zeitung* (1848-9). He was a member of the National Liberal party in the German Reichstag (1871-80). He was a free-trader and opposed the economic policy of Prince Bismarck. With other Liberals he seceded from the party, forming a group of 'Secessionists,' the later Liberal union which opposed the colonial policy of the gov. He produced many books on political and economic questions: *Erlebnisse aus der pfalzischen Erneburg*, 1849; *Monsieur de Bismarck*, 1868; *Die fünf Milliarden*, 1873; *Deutschthum und Judenthum*, 1880.

Bambino (It., babe), a term in art applied to the swaddled figure of the infant Christ, and particularly to the Santissimo B. in the church of Ara Cœli, Rome, which is supposed to have miraculous healing power. It is a richly decorated figure carved in wood. The festival of the B. takes place at Epiphany.

Bamboccio, Peter de Laerne (1613-*c.* 73), Dutch artist, born at Laerne, Holland. He was sent to Rome by his parents to study art. Classical art he neglected, and delighted in fairs, rustic parties, banditti, etc., subjects which the Italians comprise under the general name bambocciati. Hence his name, Bamboccio, not, as some have said, owing to the deformity of his person.

Bamboo is the common name of *Bambusa*, a genus of Graminæ which grows in the tropics of Asia, Africa, and America. The plants are in reality merely gigantic grasses with a jointed subterranean rhizome, which is the true trunk of the B., the shoots being the branches. The stems are hollow and contain only a light pith, but they are jointed and at the nodes strong partitions stretch across the inside. The Bs. grow in clumps, and may reach a height of 120 ft. and a thickness of 10 in. The young plants for the first few years are concerned only in producing a well-stored rhizome, but when once they begin to increase in height their growth is very rapid. Some species flower only once, some every year, and others at longer intervals.

The B. is noted for its great economic importance, and serves a variety of useful purposes. The young shoots of some species are cut when tender and eaten like asparagus; the seeds also are sometimes used as food, and for making beer; some species exude a saccharine juice at the nodes which is of domestic value; the rhizomes and shoots, when pickled, form a condiment; silica, found in the stems of *B. arundinacea*, is used in eastern medicine. The hard stems are converted into bows, arrows, quivers, lance-shafts, masts of vessels, bed-posts, walking-sticks, poles of palanquins, rustic bridges, bee-hives, water-pipes, gutters, furniture, ladders, domestic utensils, and agricultural implements. Split up finely they afford a most durable material for weaving into mats, baskets, window-blinds, ropes, and even sails of boats. Perhaps the greatest use to which they are put is in building, for in India, China, Japan, Assam, Malay, and other countries of the East, houses are frequently constructed solely of this material.

Bamborough Castle, in the vil. of B., off the coast of Northumberland, 16¼ m. S.E. of Berwick. According to the *A.-S. Chronicle* it was built by Ida, first King of Northumbria, in 547, and called Bebbanburh after his wife, Bebbe. It is very impressive in its massive strength and dignity, rising high out of a rock 150 ft. above the sea. It belongs to the Norman period, and has a fine keep and an apsidal chapel dedicated to St. Peter. The castle was attacked by Penda, King of Mercia, in 642, and was twice taken by Dan. invaders. In 1095 Robert de Moubray surrendered the castle to William Rufus. During the Wars of the Roses it was twice taken by the Yorkists and twice recaptured by Margaret. Elizabeth appointed Sir John Forster to be its governor, but this right was forfeited by his descendant, Tom Forster, for his share in the rising of '15. In 1721 the castle was bought by Lord Crewe, and its restoration was carried out under the direction of Rev. Dr. John Sharpe. From this time onwards the proceeds from the castle went to charitable purposes till in 1894 it was bought by Lord Armstrong for almshouses. B. was a royal borough and returned two members to parliament. Grace Darling's grave is in the churchyard.

Bambuk, a hilly country in W.

Africa, formed by the angle between the R. Senegal and its trib. Falemé. The climate is unhealthy, but the soil is rich and remarkable for its fertility. The vegetation consists of tamarind, baobab, calabash, acacias, and palm-trees. Maize, rice, millet, cotton, and water-melons are cultivated. The country is rich in iron-ore and gold deposits, the latter especially in the R. Falemé. The pop., estimated at 800,000, consists of Mandingoes, professedly Mohammedans. The country belonged to the Portuguese in the 15th century, and was recognised as part of the Fr. Soudan in 1858. The chief tns. are Kayes, Faranaba, and Mardinka.

Bambusa, a genus of tropical grasses consisting of the various species of bamboo (*q.v.*).

Bamian, a famous valley in Afghanistan, 50 m. N.W. of Kabul, near the northern base of the Koh-i-baba Mts. The Bamian or Hajikhak Pass, at an elevation of 8496 ft., on the road from Kabul, is the only known pass for military purposes over the Hindu Kush, and was once crossed by Alexander the Great. There are a number of cells hewn in the rock, and carved human figures of enormous size. The largest figure stands 173 ft. high. These remains seem to indicate that the place was once a centre of Buddhist worship. There are many interesting ruins of mosques and tombs belonging to the old city Ghulghuleh, which was destroyed in 1221 by the Mongols under Genghis Khan.

Bampton, a market town in co. Devon, 6 m. N. of Tiverton. There is a weekly mrkt. held on Saturday, and two fairs in the year, one on Whit Tuesday, and one on the last Thursday in October. Pop. (1901) 1657.

Bampton, John (1689-1751), an Eng. divine and the founder of the B. Lectures (*q.v.*). He graduated from Trinity College, Oxford, 1709, and took his M.A. in 1712. He held a preferment in Salisbury Cathedral from 1718 till his death.

Bampton Lectures, a course of eight divinity lecture sermons, called after their founder, the Rev. John B., canon of Salisbury (1689-1751), who left an estate of £120 for their endowment. They are preached in alternate years at Great St. Mary's, and thirty copies are pub. within two months of their being preached at the expense of the estate. The lecture is chosen on the fourth Tuesday in Easter term by the heads of colleges, and the lecturer must be an M.A. of Oxford or Cambridge, and cannot be chosen twice. The lectures must be based 'upon the divine authority of the holy Scriptures—upon the authority of the writings of the primitive Fathers as to the Faith and Practice of the Primitive Church—upon the Divinity of our Lord and Saviour Jesus Christ—upon the Divinity of the Holy Ghost—upon the articles of the Christian Faith, as comprehended in the Apostles' and Nicene Creeds.'

Ban, a word found in many modern languages in Europe in various senses, but as the idea of publication or proclamation runs through them all, it is, probably, the ancient word B. still preserved in Gaelic and Welsh, with the sense of proclaiming. It occurs in Spenser, Marlowe, and Shakespeare. On the foundation of churches and monasteries, writings were drawn up specifying what lands the founders and other benefactors endowed them, and as these frequently concluded with curses which would fall on any one who should attempt to divert the land from the purposes for which they were bestowed, the word has come to be associated with cursing. Hence the common use of the term. Persons who escaped from justice or opposed the church were placed under a B. (*see* BANISHMENT). A similar word was used in Germany with the sense of outlawry. In France a proclamation to call the people to arms was called a B., and those people liable to be called out came under the same name, so we have the *banlieue* of a city, and hence the modern use of the word. The French also use the word in the sense of the English word banns (*q.v.*, under MARRIAGE).

Ban, Banus, from the Slavonian *ban*, a chief, was the name given to a governor of certain dists. in the kingdom of Hungary, Dalmatia, Croatia, Slavonia, Bosnia, and Szörény. His power was unlimited, like that of a margrave, and he took command in time of war for the defence of his banat. In 1849 the Bs. of Croatia, Slavonia, and Dalmatia were declared independent of Hungary and received their orders from Vienna. In the year 1867 these banats were incorporated with Hungary, and one of the Hungarian ministers was appointed B. of Croatia and Slavonia by the king under the direction of the president of the council and the Hungarian ministers.

Banam, a tn. in Cambodia, Cochin China, on the Tien, cap. of the prov. B.; pop. 28,000.

Banana, or *Musa Sapientum*, is a species of the small order Musaceæ, which grows in all tropical countries but America. The fruit is a longish berry, from which, through over-cultivation, the seeds have disappeared, and forms one of the most valuable of foods. The plantain or pisang, tech-

nically known as *M. paradisiaca*, has a larger fruit of a milder taste. The plants on which they grow are in reality herbs, but have a tree-like appearance, and attain a height of 5 to 25 ft. At the apex of the stem grows a bunch of palm-like leaves, from the centre of which the flowers grow in spikes. In tropical countries the fruit is the chief food, and *M. textilis* of the Philippine Islands yields the fibre known as Manila hemp.



BANANA TREE

Banana, a trading-port of the Congo Free State, Western Africa, cap. of the dist. of the same name. It is situated at the N. of the mouth of the Congo. There are a number of Eng., Fr., and Dutch factories, and steamships run to Liverpool, Antwerp, and Hamburg. The chief exports are palm-oil and nuts, gum and rubber.

Bananal, a tn. of Brazil, in the E. of the state of São Paulo, on the railway running between São Paulo and Rio de Janeiro.

Banas, a riv. of Rajputana, India, near the Aravalli Hills. It flows in a north-easterly direction until it joins the Chambal. Length about 300 m.

Banat, in general, a region under a ban; more particularly applied to a dist. in S. Hungary, embracing Temes, Torontal, and Krassó-Szörény, though it was never ruled by a 'ban' or governor. It is bounded by the Maros on the N., Danube on the S., and Theiss on the W. Area 11,009 sq. m.; pop. (1900) 1,336,832. The dist. is one of the most fertile in Europe, the crops of wheat and grain being excellent. The vine is cultivated to a great extent, and there are valuable mineral deposits, especially coal. The country was in the possession of the Turks, 1652-1716; in 1779 it was united with Hungary; 1849 formed into an Austrian crown land; 1860 restored to Hungary. The prin. town is Temesvár.

Banbridge, a tn. in co. Down, Ireland, on the Bann, 22 m. S.W. of Belfast. Its prin. manuf. is linen. Pop. (1901) 5006.

Banbury, a tn. in Oxfordshire on the Cherwell and the Oxford Canal, 23 m. N. of Oxford. The tn. has historic interests. The Yorkists were defeated in the neighbourhood in 1469. The old castle, built in 1125, was destroyed during the Civil War, when B. was noted for its Puritanic zeal. The term 'B. man' came to be used as an equivalent for a typical Puritan. B. Cross, of nursery rhyme fame, existed down to the time of Queen Elizabeth, and has now been replaced by a modern one. The tn. is still noted for its cake, cheese, and ales; the prin. industry is the manuf. of agric. implements. Pop. 12,967.

Banc, in law, a seat or bench of justice. 'Sittings in B.' or 'in banco' were formerly held at Westminster before two or more judges of the King's Bench and Exchequer and the Courts of Common Pleas. By the Judicature Act of 1873 two or more judges of the King's Bench or Probate Div. of the High Court, sitting together 'in B.' for the purpose of trying issues of fact, are called a divisional court.

Banca, an is. in the Malay Archipelago, belonging to the Dutch, situated S.E. of Sumatra, from which it is separated by the Strait of B. With one or two neighbouring is. it forms a separate Dutch residency; pop. (1900) 106,305, of which a large majority are Chinese. Area about 4500 sq. m. The most important product is tin, but other minerals found are gold, iron, silver, lead, amber, arsenic, and lignite. The chief vegetable products are bananas, durian, cocoa-nuts, nutmegs, benzoin, and sago.

Banchory, a vil. of Scotland, in Kincardineshire, on the l. b. of the Dee, 16 m. from Aberdeen, on the Deeside Railway; pop. about 1500.

Banco, a financial term, signifying the standard value in which banks formerly kept their accounts. It was not represented by any coinage. A fixed value was necessary, owing to the depreciation of currency when coins were chipped, or worn, etc. These the early banks of Amsterdam, Hamburg, Venice, Genoa, and other places received at their intrinsic, not nominal, value.

Bancroft, George (1800-91), an eminent American historian, diplomat, and statesman. He graduated from Harvard College at the age of seventeen, studied history in Göttingen, where he received a degree of doctor of philosophy, and on his return to America in 1820 became Gk. tutor at his own college. In conjunction with Dr. Joseph Cogswell he estab. a school at Northampton, with which he was connected till 1830, when he devoted himself wholly to historical studies. He was made collector of the port of Boston, 1838-41, by President Van Buren. As secretary of the Navy he had a seat in the cabinet of President Polk, 1845.

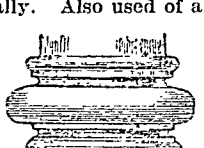
Appointed minister to Great Britain, 1846-49, minister to Berlin, 1867-74. He was a keen democrat, and his historical work, written at the time of the Civil War, was influential in inspiring an ideal conception of liberty in the people of his generation. The first vol. of *The History of the United States* appeared in 1834. His miscellaneous publications are numerous and include: *Poems*, 1823; *History of the Colonisation of the United States*, 1841; *An Oration* (in memory of Andrew Jackson), 1845; *A Plea for the Constitution of the United States*, 1886; *Martin Van Buren*, 1889.

Bancroft, Hubert Howe, an American historian, *b.* at Granville, Ohio, 1832. He started a bookshop at San Francisco in 1852, and made a large fortune which he has devoted to collecting documents, chiefly about American history, and forming a fine library. His own contributions to historical literature are: *The Native Races of the Pacific States*, 1874-6; *The History of the Pacific States of N. America*, 1882-90; *Popular History of the Mexican People*, 1888; *British Columbia*, 1887; *The New Pacific*, 1900.

Bancroft, Richard (1544-1610), an Eng. prelate. He was born at Farnworth, Lancashire, and was sent at the expense of his great-uncle, Hugh Curroen, Archbishop of Dublin, to Cambridge. In 1576 he became rector of Teversham, near Cambridge, and rose rapidly to the bishopric of London in 1597. He became Archbishop of Canterbury in 1604, and chancellor of Oxford University in 1608. In the reign of James I. he was appointed commissioner on behalf of the Church of England in the Hampton Court Conference. He was a bitter opponent of Puritanism and a zealous supporter of the theory of the divine origin of episcopacy.

Bancroft, Sir Squire, an Eng. actor-manager, born in London 1841. His first appearance on the stage was at the Theatre Royal, Birmingham, as Lieutenant Manley in *St. Mary's Eve*. He remained in the provs. for four years. In 1865 he appeared in London at the Prince of Wales' Theatre as the leading actor, under the management of H. J. Byron and Marie Effie Wilton. Two years later he married Miss Wilton and continued with her the management of the Prince of Wales' till 1880, when they moved to the Haymarket. They retired together in 1885. In 1893 he appeared by the command of the late Queen Victoria at Balmoral Castle in *Diplomacy*. He was knighted in 1897. By his recitations of the *Christmas Carol* he has collected large sums of money for hospitals. Collaborated with Lady B. in *Mr. and Mrs. Bancroft On and Off the Stage, Written by Themselves*, 1888; and is the author of the *Bancroft Recollections of Sixty Years*.

Band, in architecture, the name given to a flat face or fascia, encircling a building or continued along a wall, usually horizontally. Also used of a B. of foliage, quatrefoils, or bricks. Special varieties of Bs. are indicated by the terms lintel course, frieze, plat band, string course, etc.



BAND

The B. of a shaft is the moulding which encircles pillars or small shafts, characteristic of Gothic architecture, and very prevalent in the Early English style.

Band, the linen appendage to the neck-cloth or collar forming a part of the clerical, legal, or academic costume. Some regard it as a survival of the amice, while others date it back to the collar worn by laymen in the reign of James I. It still forms part of the legal costume in England, but has been replaced in Scotland by the white tie, except in the case of the king's counsel. It is seldom worn in the Anglican Church, except by a few low churchmen, but is commonly used by ordained Presbyterian ministers as distinguished from licentiates.

Band: 1. *Military.*—Military Bs. are composed wholly of wind instruments and drums. The Bs. attached to British regiments are 'brass Bs.' and 'drums and fifes,' and to Scottish regiments 'pipers.' The instruments used in cavalry and artillery regiments are bugles and trumpets, and in infantry and Highland regiments bugles, fifes, bagpipes, and drums. In 1857 the gov. instituted a Royal Military School of Music at Kneller Hall, near Twickenham, which was at first supported partly by gov. and partly by the various British regiments. In 1867, however, the War Office took over the entire expenses. This institution trains B. sergeants, recommended by their commanding-officers, for the position of band-master, and also trains promising young instrumentalists from such schools as the Duke of York's. According to the gov. regulations, each B. consists of a band-master and band-sergeant, and in cavalry regiments fifteen privates, and in infantry twenty privates, in addition to the trumpeters, buglers, and drummers. The total number of performers is usually between forty and fifty.

Every officer, when serving abroad, contributes not more than twelve days' pay of his rank to the B. fund. Apart from these subscriptions, gov. maintains the upkeep of regimental Bs. The best known military Bs. are the guards, the royal engineers, the royal artillery, and the royal marines. The duty of regimental Bs. is to play at parade, at 'marches out,' at the officers' mess, and when required to do so by their officers. When the regiment leaves home on active service the B. is usually left at home, unless the regiment is expected to be absent on long service.

2. *Naval.*—Flag-ships and other large ships in the Royal Navy, when commanded by an officer of post-captain or of higher rank, very frequently possess Bs. The number of performers ranges between ten and fifteen, the bandsmen being recruited from the boy Bs. of training ships.

3. *Volunteer, etc.*—With the growth of the volunteer movement, many volunteer Bs. have been formed, which are organised as far as possible on the model of the army Bs. Many tns. and dists. possess brass Bs., more or less resembling military bands.

Band, Bund, or **Bend,** the Persian word for a dyke or artificial embankment, is often met with as a component part of names in eastern geography; for example, in the name of the Persian riv. Band-Emir. This riv. was so called after Emir Azadaddaula, a governor of Farsistan, who raised a dyke on the riv. near the ruins of Persepolis in order to procure water for fertilising the land.

Banda, cap. of the dist. of the same name, United Provs., India, situated on the r. b. of the R. Ken. There are 66 mosques and 161 Hindu temples in the city. It is a centre of the cotton trade. Pop. (1901) 22,565.

The dist. has an area of 3061 sq. m.; pop. (1901) 631,340.

Banda Islands, a group of is. belonging to the Dutch E. Indies, situated about 50 m. S. of Ceram, their mean lat. and long. being respectively 4° 30′ S. and 129° 50′ E. Area 17 sq. m. The is. are volcanic, the Gunong-Api, 1744 ft. high, rising from the centre of the group. There are twelve is. in all, the most important being Banda-Neira, Banda-Lantoir, Gunong-Api, and Pulo-Ay. The pop. is estimated at 8000, about 7000 of which are native descendants of emancipated slaves. Nutmeg is the chief production, but sago, mace, and cocoanuts are also cultivated. Nassau, in Banda-Neira, is the centre of trade and the seat of the Dutch government.

These is. were first visited by the Portuguese, who made a settlement in 1520, but they were expelled by the Dutch c. 1580. The Eng. afterwards contended for a settlement, but the is. were finally acquired by the Dutch, 1801-16.

Bandages are strips of muslin or other material, of varying widths and lengths, used by surgeons to support a part of the body or to restrict movement, to apply pressure in order to prevent bleeding or swelling, or to fix dressings or apparatus in their places. B. may be simple, when they consist of one piece, as the roller and triangular B.; or compound, when they consist of two or more pieces.

The *Roller B.* is usually a strip of calico, flannel, linen, or muslin, about 18 ft. in length and 2 to 4 in. in width. In bandaging a limb, the turns commence at the extremity and proceed upwards, so that the blood is partly driven from the limb. Circular bandaging consists of taking circular turns around the part, each loop covering about two-thirds of the width of the loop previously applied. Oblique bandaging means making the loops at an oblique angle to the axis of the limb. As the arm and leg gradually increase in diameter from the extremity upwards, simple circular or oblique bandaging would tend to bind the limb by the edge of the strip only, leaving portions of the skin too loosely bound. To remedy this, the B. is occasionally reversed; that is, the strip is turned so that the surface previously in contact with the limb becomes the exterior surface, and *vice versâ*. When a joint such as the knee or elbow has to be passed, the turns cross each other like a figure of 8. The 'spica,' also used for passing projections in the limb, is an arrangement resembling the overlapping of the husks in an ear of corn. When sufficient turns have been taken, the end of the B. may be split in two, one tail carried round the limb in a direction reverse to the turns and securely tied to the other tail; a better plan is to sew the end, or fasten it by a safety pin, care being taken to pass the needle or pin through two or three previous loops, so that the whole may be held firmly together without undue pressure from any single loop. The fingers and toes should never be bandaged with two injured surfaces touching, as there would be considerable danger of adhesion. If the extremities of the toes or fingers are not involved in the injury, they should be left uncovered, as their appearance will indicate whether the circulation has been unduly interfered with, when the B. will have to be readjusted. Any inequalities of pressure may be remedied by the use of paddings of cotton wool.

B. of rubber fabric are used when considerable pressure is required, as in sprains or varicose veins. Martin's rubber B. is used to lend support in cases of varicose veins. It consists of a roller B. which is wound spirally about the leg while the patient is in a horizontal position. It should not be tight, and the necessity for reversing is obviated as the elasticity of the rubber tends to keep all parts of the B. in contact with the surface of the limb. Esmarch's B. is used to prevent hæmorrhage from a limb during amputation. It is wound spirally about the limb with considerable pressure, beginning at the extremity, so that the blood is driven from the limb as much as possible. When the B. has passed above the seat of the proposed operation, a thick piece of rubber is bound rightly round the limb so as to prevent the return of the blood and thus save it for the remainder of the body. Before the widespread use of anæsthetics such an arrangement was used not only to prevent hæmorrhage, but to diminish pain.

The *Triangular B.* consists of a piece of thin calico made by cutting a square yard diagonally, two such B. being thus provided. The 'broad B.' is made by bringing the right-angled 'point' to the 'centre' of the long side, and folding the trapezium thus formed once again. The 'narrow B.' is made by folding the broad B. yet again. The triangular B. is used chiefly in 'first aid' work, being adaptable to many different uses. To cover the top of the head for securing dressings on wounds, the 'centre' should be placed between the eyebrows, the 'point' allowed to hang over to the back of the head, and the ends passed round to the back, crossing over the point and brought together again on the forehead, where they are secured by a reef knot; the point is then turned up and safety-pinned on the top of the head. A sling for fracture of the collar-bone or fore-arm is made by placing one end of the B. over the sound shoulder, the operator standing in front of the patient; the forearm of the injured part is then drawn across the chest so that the 'point' of the B. is on a level with the elbow; the other end of the B. is brought in front of the arm and carried over the shoulder of the injured side, the two ends being tied behind the neck, but in such a position that the knot is not in the way of the patient when lying down; the 'point' is then brought round the elbow and secured in front by a safety pin. To B. the foot, the sole is placed on the B., the toes being directed to the point. The point is then brought up above the front of the ankle, the ends crossed over the instep, and the point passed under the foot and over again and tied behind the ankle. The triangular B. may also be made into a tourniquet by folding it very narrow and tying a knot in the middle. The knot is placed over the artery when the bleeding occurs in the upper arm or thigh; the ends are passed round the limb and tied tightly. Additional pressure may be imparted by pushing a thick pencil between the tourniquet and the limb, and twisting it. In tying knots in B. the reef-knot must be used in preference to the granny-knot; that is, after tying one knot in the ordinary way, the second half should be tied in the reverse direction.

Bandaisan, a volcano of 5100 ft. in height, situated in the main is. of Japan. A terrible eruption occurred in 1889.

Bandana, the name applied to a particular kind of silk or calico handkerchief on which has been printed a pattern made up of spots and diamonds. B. handkerchiefs were originally made in India, but are now manufactured extensively in England. The handkerchief is first dyed one colour, and then placed between leaden plates, on which the pattern has been cut out, and put into a powerful Bramah press, when the colour is discharged by means of a bleaching liquid, and the spots are left white on the dyed background.

Bandar, Bundur, Bunder, or Bender, the Persian word for a harbour, is in eastern geography frequently met with as the component part of proper names, especially of many sea-ports; for example, Bender Gez.

Bandawe, a mission station in Nyassaland, British S. Africa, on the W. shore of Lake Nyassa. It is situated at the base of the Angoni Mts., and the climate is unhealthy.

Bandel, Joseph Ernst von (1800-76), Ger. sculptor, born at Ansbach in Bavaria, and died at Neudegg. He studied at Munich, Rome, and Hanover, and his chief work was a colossal statue of Arminius, at Detmold, which was completed in 1875.

Ban-de-la-Roche, or **Steinthal**, a tn. in the valley of Alsace, in the Vosges Mts., noted as the scene of the labours of the Protestant pastor, Oberlin (*q.v.*). At the entrance to the valley, in the village of Fonday, is his tomb.

Bandello, Matteo (*c.*1490–1561), an Italian writer of *novelle* or tales. He was born at Castelnuovo in Piedmont, and in early life entered the Dominican order at Milan. In 1525 he left Italy after the battle of Pavia, and settled in France, where he became

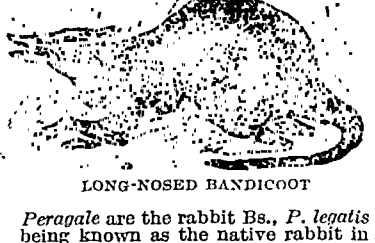
Bishop of Agen (1550) and died there eleven years later. His *novelle*, which are 214 in number, rank second to Boccaccio's, and provided themes for Shakespeare, Massinger, Byron, and others. They were pub. at Lucca in 1554 and at Lyons in 1573. The well-known English translation is that of Fenton, 1567. The *novelle*, like most of that period, are coarse in parts, but they are written with great simplicity and fluency, and the narrative is vivid and direct. B.'s characterisation is excellent, but he lacks the wise humour of his master, Boccaccio.

Banderole (It. *banderuola*, little banner), a small streamer fixed to and folding over the staff of a crozier.

Bandes Noires. This appellation was first given to a body of Ger. foot-soldiers, who were employed in the Italian wars by Louis XII. of France, in consequence of their carrying black ensigns after the death of a favourite commander. Another body of troops, formed of Italians, afterwards took the same name from the same cause, on occasion of the death, in 1526, of their leader Giovanni de' Medici: and still later the Fr. regiment of Piedmont, who had served for a long while in Italy, followed the same example after the death of their colonel, the Comte de Brissac in 1569.

Band-fish is a marine fish of the family Cepolidæ. It is elongated and has spiny rays. *Cepola rubescens*, the red band-fish, is a British species of vivid hue, and is about 15 in. long.

Bandicoot is the common name for the family of the Marsupials known as Peramelidæ. They are all natives of Australasia, and none are larger than a hare. In the structure of the hind feet they resemble the kangaroo, but there is less disproportion between the limbs. They are all insectivorous, but sev. species are omnivorous. The



LONG-NOSED BANDICOOT

Peragale are the rabbit Bs., *P. legatis* being known as the native rabbit in W. Australia; *Perameles*, which are fond of an herbaceous diet, include *P. nasuta*, long-nosed B., and *P. myosuros*, saddle-backed B.; *Chœropus* are the pig-footed bandicoots.

Bandicoot Rat is a species of Nesokia, its scientific name being *N. bandicota*. It is a rodent of the family Muridæ, to which rats and mice belong. It is a native of the East, and its flesh is eaten by Indians and Ceylonese.

Bandiera, Attilio and Emilio, brothers of a Venetian family who incited a rising against the Bourbon tyranny of Naples in favour of Italian independence, 1843. The rising failed and they fled to Corfu. With about twenty comrades they landed at Calabria, expecting that their arrival would be the signal for a revolt. However, they were betrayed by one of their companions and were shot, with six others, in the Square of Cosenza, July 25, 1844. Their letters to Mazzini, which were opened by the British gov., aroused keen interest, and were pub. by Mazzini under the title of *Ricordi dei Bandiera*, 1844.

Bandinelli, Baccio, or **Bartolommeo** (*c. 1489–1561*), Italian sculptor and painter, and disciple of Leonardo da Vinci. According to Vasari, his affection for da Vinci and hatred for Michael Angelo led him to destroy the famous cartoon of the latter, which was supposed to excel Da Vinci's on the same subject. Amongst his best known sculptures are a statue of St. Peter, a fine copy of the Laocoon, 'Hercules slaying Cœus,' Baccus and Orpheus,' and 'Adam and Eve.' *See* Vasari's *Lives* and Benvenuto Cellini's *Autobiography*.

Banditti, *see* BRIGANDS.

Band of Hope Movement, started about 1847 with a number of disconnected children's temperance societies, organised itself in 1855 into The United Kingdom Band of Hope Union, which has now over 25,000 branches and upwards of 3,000,000 members. The official organ of the union is the *Band of Hope Chronicle*.

Bandolier, also **Bandoleer** and **Bandileer,** a broad leather belt worn over the shoulder, across the breast, and under the arm. As worn by the old musketeers, it had attached a bag for balls and a number of metal cases or pipes, each containing a charge of gunpowder. The modern B., as used in the British army, is fitted with leather pockets for cartridges.

Bandoline, a gummy perfumed substance, variously produced from quince seeds, gum tragacanth, and Irish or Iceland moss, used to impart glossiness and stiffness to the hair. It is usually scented with otto of roses or oil of bitter almonds.

Bandon, or Bandonbridge, a tn., co. Cork, Ireland, 20 m. S.W. of Cork, on both banks of R. Bandon. Has distilleries and woollen, leather, and cotton industries. Pop. 3000. The R. Bandon, 40 m. long, rises in the

Carberry Mts., near Dunmanway, and flows S.E. into the harbour of Kinsale.

Bandong, tn., Java, 75 m. S.E. of Batavia. It is situated on the W. coast, near the volcano of Guntur. Pop. 20,000.

Bandra, a tn. in the Thána dist., British India, connected with Bombay by a causeway and bridge; pop. 20,000, of which about 6500 are Christians.

Bandy, or hockey on the ice, is a game very similar to hockey on land. It is played by skaters on broad sheets of ice, preferably not less than 100 yds. by 50 yds. There are two opposing teams, consisting of eleven players each. The B. is a stick, not quite so curved as an ordinary hockey stick, and with both sides flat; it is made of ash wood, without any metal bindings, and is about 3½ ft. long. The B. must never be raised above the shoulder during the play. The ball (sometimes called 'cat') is made of solid india-rubber, and is about the size of a tennis-ball. The goals consist of two upright posts, 12 ft. apart, and are placed facing each other in the centre of the short sides of the ground. The game lasts 1½ hr. with an interval for 'half-time,' when the players change ends.

The game is popular in the United States (where it goes by the name of 'shinney' or 'shinty'), and in Holland, Norway, Sweden, and Switzerland. In England the popularity of the game must necessarily suffer from the uncertainty of the climate, but there are a good number of clubs, notably one at Virginia Water, Surrey, and at Bury Fen, Hunts.

Baneberry, or Herb Christopher, is the *Actæa spicata*, a species of Ranunculaceæ, a native of Europe. When mature the plant bears black and poisonous berries.

Baner, Banner, or Banier, Johan (1596–1641), Swedish general, was *b.* at Djursholm near Stockholm, and *d.* at Halberstadt in Germany. At the battle of Breitenfeld, Sept. 17, 1631, he commanded the right wing of the army under Gustavus Adolphus, and on the death of Gustavus he was made field-marshal. His two most celebrated victories were those of Wittstock in 1636 and Chemnitz in 1639.

Banff: 1. Seaport, royal and parliamentary burgh, and cap. of Banffshire, at mouth of R. Deveron, on the Moray Firth, 50 m. N.W. of Aberdeen by rail. It has woollen, leather, rope, and sail manufs., iron foundries and shipbuilding yards, and is the headquarters of an important fishing industry. There is a considerable export trade. The adjacent tn. of Macduff, with a good harbour, is included in the burgh. Amongst the chief edifices are the county buildings, the town hall, the Chalmers hospital, the academy, the masonic hall, and the museum. Duff House, presented to the burgh by the late Duke of Fife in 1906, contains a fine collection of pictures and an armoury. B. is a place of considerable antiquity, having received its first charter from Malcolm IV. in 1163. The old castle, of which but little now remains, was the bp. of Archbishop Sharp. The modern castle is the property of the Earl of Seafield. *See* Finlach's *History of Banff*, 1868, and Cramond's *Annals of Banff*, 1891, etc. Pop. 3800. 2. Post-tn., Alberta, Canada, on the Canadian Pacific Railway, 922 m. W. of Winnipeg and 560 m. E. of Vancouver. It is situated amongst the beautiful scenery of the Rocky Mts. National Park, and is a noted tourist resort.

Banffshire, maritime co., N.E. Scotland, bounded on the N. by Moray Firth, on the E. and S. by Aberdeenshire, and on the W. by the counties of Inverness and Elgin. The surface in the S. is mountainous, the land in the N. being flatter and more fertile. Partly in the co. are Cairngorm Mt. (4085 ft.) and Ben Macdhui (4296 ft.). The chief rivs. are the Spey, Avon, and Deveron. The chief lochs are Loch Avon, Loch Builg, and Loch Etchachan. Cattle-breeding is the prin. rural industry. Other important industries are fishing and whisky distilling. The co. tn. is Banff. The other chief tns. are Portsoy, Cullen, Buckie, and Keith. Area, 633 sq. m. Pop. 61,000. Pictish remains are to be found at Rothiemay, Ballindalloch, Boharm, and
remains at
Findlater, ar
the scene of many strenuous conflicts between the Scots and Norse invaders. The co. returns one member to parliament.

Banffy, Desiderius, Baron (*b.* 1843). Hungarian statesman, was born at Klausenburg, Transylvania. In 1892 he became president of the Lower House, and from 1895-99 was prime minister of Hungary. In 1903 he was again at the head of a radical party and a leader in parliament.

Bang, Hermann Joachim, a Danish author. He was born in 1857, in the Is. of Seeland, and received his education at the Academy of Sorö and at Copenhagen. His novels include: *Haa blöse Slägter*, 1880; *Fädra*, 1883; *Stille Existenser*, 1886; *Liv og Död*, 1900; and *Mikaël*, 1903. He has also written critical works, as, for example, *Realisme og Realister*, 1879, and has contributed articles to various periodicals.

Bangalore, cap. of Mysore state, India, 216 m. by rail W. of Madras.

and 70 m. N.E. of Seringapatam. It has a healthy climate, being situated over 3000 ft. above the sea-level, and is equipped with good drainage and an excellent water supply. There is a considerable European settlement, and quite a large number of the natives are Christians. It has cotton and other manufs. The fine botanical garden is worthy of note. The tn. was a favourite residence of Hyder Ali. It was captured by Lord Cornwallis in 1791. Pop. 160,000.

Banganapilli, or **Banganapilly**, a tn. in Madras, British India, cap. of a small native state, 89 m. E. by N. of Bellary; pop. 32,000.

Bangar, a tn. in La Union prov., Luzon, Philippine Is., 17 m. from San Fernando. It produces alluvial gold, and agric. products such as tobacco, rice, cotton, etc. Pop. about 9000.

Bange, Charles Timothée M. V. Ragon de, a Fr. officer, *b.* at Balignicourt, Aube, in 1833. He has distinguished himself by his organisation of the artillery system of the Fr. army, and by his invention of the cannon which is called after his name. He became a colonel in 1880.

Bangka, *see* BANCA.

Bangkok, cap. of Siam, on the Menam, 20 m. from its mouth. The older part of the city is built on rafts, but more civilised methods of town-planning have in recent years made rapid headway, and Bangkok is now supplied with good roads, an excellent tramway system, and many fine modern buildings, including the government offices, the arsenal, and the mint. The sanitation has greatly improved, though the death-rate is still high. Chinese form a large proportion of the pop., and with the Europeans, control its very extensive trade, 75 per cent. of which is with the British empire. The chief exports are rice, teak, cattle, and pepper, the prin. imports being textiles, machinery, tea, opium, bullion, and gold-leaf. There are four railway stations. The number of its beautifully coloured temples makes B. one of the most picturesque cities in the E. The area of the city is about 10 sq. m. Pop. 630,000.

Bangor: 1. Episcopal city, seaport, and municipal borough, Carnarvonshire, N. Wales, on the Menai Strait, 9 m. N.E. of Carnarvon. The chief trade is the export of slate from the famous Penrhyn quarries. The cruciform cathedral was hardly a credit to the tn. until restored by Sir Gilbert Scott (1869-80). The University College of N. Wales is situated here. Pop. 12,000. 2. Seaport and watering-place, on Belfast Lough, co. Down, Ireland, 12 m. E.N.E. of Belfast. Carries on embroidering and flowering of muslin. *Pop. 6000.* 3. City and co. seat, Penobscot co., Maine, U.S.A., on the Penobscot R. at its junction with the Kenduskeag stream. Has extensive manufs. of boots, shoes, and clothing, and is one of the chief lumber depôts of the United States. Pop. 25,000.

Bangorian Controversy. This famous dispute arose out of a sermon preached before George I. in 1717 by Bishop Hoadly of Bangor. In this sermon Hoadly denied the right of the Church to exercise authority over the conscience. The Lower House of Convocation was preparing to take steps against the author of these opinions, when it was prorogued by parliament for a period of some months. Amongst those who attacked Hoadly were Thomas Sherlock, then Dean of Chichester, Francis Hare, Dean of Worcester, and William Law.

Bangweolo, or Bemba, lake, Northern Rhodesia, 3700 ft. above the sea-level. Area of open water, about 1670 sq. m. in dry season. It is very shallow, and is said to be nowhere deeper than 15 ft. It was first discovered by Livingstone in 1868.

Banialuka is a tn. in Bosnia, situated on the R. Verbas, about 60 m. S.E. by E. from Novi. Noted as being a Roman Catholic bishopric, though the inhab. are fairly equally divided between Mohammedans and Christians. It is also the seat of a Greek metropolitan. *Pop. 14,000.*

Banian Days. Originally a sailor's name for the days when meat was not served to the crew, this phrase has now come to be applied to any period of indifferent feeding. The expression owes it

meat

class of Hindu merchants who were a caste of the Vaisya.

Banian Tree, *see* BANYAN.

Banians, a class of Hindu traders, a caste of the Vaisya, who, on religious principles, abstain from meat. It is estimated that there are over 3,000,000 of them scattered over various parts of Asia, chiefly in Bengal and Western India. They are noted for their shrewdness and business-like qualities. They carry on an extensive caravan trade with the interior of Asia, and engage in extensive money-lending transactions, charging high rates of interest.

Banias, a vil. in Palestine, on the site of the ruins of Paneas, afterwards changed by Philip the Tetrarch, son of Herod, to Cæsarea Philippi. It is situated near the sources of the Jordan, at the foot of the Anti-Libanus (Jebel Heish), the Mt. Hermon of Scripture, and is 45 m. W.S.W. of Damascus. The tn. came

into prominence during the time of the Crusades, about the 13th century, when the castle of B. was built, the ruins of which may still be seen.

Banim, John (1798–1842), the Irish novelist, poet, and dramatist, was a native of Kilkenny, where his father was farmer and trader in sporting accessories. He was educated at Kilkenny College, where he exhibited a decided talent for art and poetry. He decided to adopt the artistic profession, and studied at the academy of the Royal Dublin Society. He subsequently became a drawing-master in Kilkenny. At this time he suffered a serious breakdown in health owing to an unfortunate love affair. In 1820, after several years of ill-health and disappointment, he settled in Dublin, ultimately abandoning art for literature. In 1821 the production of his tragedy, *Damon and Pythias*, brought B. fame and money, and in 1822, he and his brother Michael set about the writing of a series of Irish tales on the lines of Scott's Waverley novels. Their *Tales of the O'Hara Family* (1st series, 1825) attained great popularity. His next novel, *Boyne Water*, was not very favourably received, but he was more successful with *The Nowlans* (included in the O'Hara Tales). During the whole of his literary life B. suffered greatly from ill-health, and often from severe poverty. He was granted a civil list pension in 1836. B.'s descriptions of the life and habits of the Irish peasantry are wonderfully realistic, and in certain respects he is the superior even of Miss Edgeworth. Amongst his other works are the book of essays entitled *Revelations of the Dead-Alive*, the tragedies of *Turgesius* and *Sylla*, and the poem *The Cell's Paradise*. *See* Murray's *Life of John Banim*, 1857.

Banim, Michael (1796–1874), elder brother of John B., and joint-author of *Tales of the O'Hara Family*, was originally intended for the law, but was compelled to renounce his studies owing to his father getting into financial difficulties. He then devoted himself with much success to the improvement of his father's affairs, giving his spare time to literature, with such a good result as *Crohoore of the Bill Hook*, one of the best of the tales. Like his brother, he was the victim of ill-health, and in his latter years lived in very reduced circumstances. His was probably the greater share in the delightful *Father Connell*, while he was sole author of the following tales: *The Croppy, The Ghost Hunter, The Mayor of Windgap, The Bit o' Writin'*, and *The Town of the Cascades*.

Banishment. This term is derived from the old word *ban*, having the various significations of proclamation, public edict, a jurisdiction and the dist. in it, and a judicial punishment. In primitive society B. meant the exclusion of an individual from the protection of the law and the benefits of society, a sentence of outlawry which also involved the confiscation of his property. In more recent times the word has come to mean expulsion from a country or place in punishment for crime. In England banishment seems first to have been introduced as a punishment in judicial procedure in a statute of Elizabeth's reign, and in the form of transportation the practice received the sanction of English law until far on in the 19th century. It is still a punishment for political offences in Russia, Turkey, and the republics of Central and South America.

Banister, *see* BALUSTER.

Banjaluka, a tn. of Bosnia on the R. Verbas. It is the see of a Roman Catholic bishop, and has many mosques. It is noted for its hot springs. Pop. 13,000.

Banjermassin, or **Bandermassin,** a riv. in South-eastern Borneo. It is navigable for about 50 m. from the sea.

Banjermassing, or **Banjermassin:** 1. Dist., Dutch Borneo, intersected from N. to S. by mts., and watered by the Banjar and other rivs. Rice is grown, and the region also produces gold, diamonds, gum, wax, spices, etc. The pop. is composed mostly of Dyaks. 2. Tn., cap. of Dutch Borneo, of the Martapura, near its junction with the Barito. B. is largely built on piles. There is an extensive trade in the products of the locality.

Banjo (a negro corruption of the word *bandore*, derived from Gk. *pandoura*, a musical instrument with three strings), a stringed musical instrument, played with the fingers, without frets to guide the stopping. It consists of a long neck, on which are the tuning-pegs, and a drum-like vellum body, and has from five to nine strings. It was introduced into America by the negroes. The pitch is one octave lower than the written notes.

Banka, or **Meng-ka,** a Chinese tn. on the Is. of Formosa. It is in a tea-growing dist., and its port is Tamsui. Pop. about 45,000.

Bankallan, or **Bangkalan,** a tn. of the Dutch E. Indies, on the coast, near the W. end of Madura I.

Bank Holidays, first estab. by Sir John Lubbock's (Lord Avebury's) Act of 1871. B. H. in England and Ireland are Easter Monday, Whit Monday, the first Monday of August, Dec. 26 (Boxing Day), or if that day falls on a Sunday, the 27th, Christmas Day and

Good Friday. In Ireland March 17 is also a B. H. In Scotland B. H. are Christmas Day, New Year's Day, and the first Mondays of May and August. On these days banks are closed, bills and notes due on such days becoming payable on the next day, except in the case of Christmas Day and Good Friday. Bills, etc., due on these two days are payable on the preceding day.

Bankipur, a tn. in India, situated in Bengal and adjacent to Patna.

Bank Note, *see* BANKS.

Bankrupt, a person who declares, or by his conduct makes it manifest, that he is unable to pay his debts and whose property is accordingly distributed among his creditors under the bankruptcy laws. In its original signification the term B. meant a trader who hid himself or did other acts tending to defraud his creditors. The term 'insolvent,' which in one sense connotes any person who is unable to pay his debts, in a more restricted sense meant a non-trader who sought the benefits of the Insolvency Acts. Since 1861, B. includes both traders and non-traders, and our whole modern law of bankruptcy applies indifferently to both. Insolvency now connotes the condition of a debtor who is unable to pay his debts but who has not been 'adjudged.' Bankruptcy legislation dates from the time of Henry VIII., when a statute was directed against fraudulent debtors, whether traders or not, and empowered the Lord Chancellor and certain other great officers of state to seize the property of the debtor and distribute it rateably among his creditors. The debtor, however, obtained no relief from his liabilities, and furthermore, it was considered fraudulent for a man to procure his own bankruptcy. The next statute, which was passed in the reign of Elizabeth, applied to traders only. Under this act the Lord Chancellor was empowered to appoint commissioners in bankruptcy, in whom the property of a B. was vested, and who assigned it to persons by whom it was realised and distributed among the creditors. No provision was made, however, for the discharge of the B. Later, in Anne's reign, the B. was able to obtain an order of discharge provided a specified number of creditors consented. A great number of other acts were passed from time to time, and ultimately consolidated and amended by the act of 1825, which introduced the principle of deeds of arrangement as an alternative to bankruptcy subject to very severe restrictions. In 1831 was constituted the Court of Bankruptcy, transferring the jurisdiction from the Court of Chancery to the new court, and reserving to the Lord Chancellor only an appeal from the bankruptcy judges. Then came the Bankruptcy Act, 1861, which extended the law of bankruptcy to non-traders. In 1869 all the above statutes were repealed and a 'trustee,' in whom the property of the B. was to vest, was substituted for the old 'official assignees.' The present law of bankruptcy is regulated by the Bankruptcy Acts, 1883 and 1890, and the Rules made thereunder. The purpose of these acts is to secure that the property of a person who cannot pay his debts in full shall be divided rateably among his creditors, and that the debtor shall then be freed from his debts either absolutely or conditionally. According to the present law, proceedings may be instituted by the debtor or by the creditors: in the former case the bankruptcy is called voluntary, in the latter involuntary. The claim of the creditors must amount to £50. On the petition being presented, the property of the debtor is taken over by an official receiver, who is an officer of the Board of Trade, and the debtor must make a full statement of affairs on oath in public, after which the creditors hold a meeting to determine whether the debtor shall be adjudged B. or whether a composition can be arranged. Such a composition must be approved by three-fourths in value of the creditors, and must receive the sanction of court. If, however, the debtor is adjudged B., the creditors appoint a trustee to distribute his estate, under the supervision of a committee of inspection. The debtor is liable to imprisonment if he refuses to assist in the discovery of his property or conceals his goods from the trustee. After the distribution of his property among the creditors the B. may obtain a discharge from the court, but the discharge is withheld under certain conditions. 1. If he has not kept proper books within three years before bankruptcy; 2, has traded after knowledge of insolvency; 3, has lived extravagantly or speculated rashly; 4, has been previously B.; 5, has contracted debts without expectation of being able to pay them; 6, has given preference to any creditor within three months before bankruptcy. A B. is disqualified from holding public office, or from sitting in parliament, unless his bankruptcy is annulled, or he obtains a discharge with a certificate from court stating that his bankruptcy was due to misfortune. By the Bankruptcy Act of 1883 the procedure is simplified in the case of persons with property less than £300, when the official re-

ceiver becomes trustee, and there is no committee of inspection. The jurisdiction was transferred by this Act from the Court of Bankruptcy to the High Court of Justice; it also provided for persons dying insolvent, the administration of whose property could formerly only be dealt with by a suit in chancery.

The code of bankruptcy differs in Ireland from that in England, and is governed by the Bankruptcy Amendment Act of 1872, when imprisonment for debt was abolished. The estate is administered by an official assignee, who acts in conjunction with an assignee chosen by the creditors. The Central Court of Bankruptcy is at Dublin, and local courts have no jurisdiction except under the direction of the Central Court.

In Scotland a B. is liable to the distributing process, known as 'sequestration.' A 'notour B.' corresponds to a person who has committed what is called in England an act of bankruptcy. There is no separate court of bankruptcy, the jurisdiction being assigned to the sheriff of a co. or to the Bill Chamber of the Court of Session. The procedure closely resembles that in England. *See also* INSOLVENCY. Consult Williams, *Law and Practice of Bankruptcy*, 7th ed., 1898; Baldwin, *Concise Treatise upon the Law of Bankruptcy*, 8th ed., 1900.

Banks, John, was an attorney in London, but he left that profession to become a writer for the stage. The seven tragedies which he left in print bear dates extending from 1677-96. He must have died at some time in the reign of Queen Anne. B. is one of those dramatists who have been despised by the critics for their literary faults; but whose works have given excellent scope to the skill of great actors, and have in their day been highly popular with the play-going public. The *Earl of Essex* kept its place on the stage till the middle of the last century, when it was superseded by the plays of Jones and Brooke, who stole successively the best parts of it.

Banks, Sir Joseph (1743–1820), naturalist and explorer, was born in London and educated at Harrow and Christ Church, Oxford. At quite an early age he evinced a passion for the study of botany, and at the university this tendency expanded itself into a keen interest in all branches of natural history. He was instrumental in getting botanical lectures added to the university curriculum. His father's death in 1761 leaving him very well off, he had ample opportunity of following his bent, and in 1766 he made a botanical expedition to Newfoundland. From 1768-71 he accompanied Cook in his voyage round the world on the *Endeavour*, which he had fitted out at his own expense. The journal kept by him at this time has proved an important source of information. In 1772 he made a trip to the Hebrides and Iceland, and was instrumental in bringing to the general notice the marvels of Staffa. In 1778 he was elected president of the Royal Society, of which he had been a fellow since 1766. This office he held till his death. B. will be remembered less by his original contributions to science than by the generous assistance which he was always ready to afford to those less fortunate than himself. Amongst those indebted to him for help were such distinguished men as Burckhardt and Mungo Park. He formed a valuable collection and library, which he bequeathed to the British Museum. In addition to various scientific articles, he wrote *A Short Account of the Causes of the Diseases called the Blight, Mildew, and Rust*, 1805; and *Circumstances Relative to Merino Sheep*, 1809. *See* Home's *Life of Sir Joseph Banks* (Hunterian Oration, 1882); Duncan's *Short Life of Sir Joseph Banks*, 1821; and Marden's *Sir Joseph Banks, the Father of Australia*, 1909.

Banks, Nathaniel Prentiss (1816-94), American politician and general, was a native of Waltham in the state of Massachusetts. After being a factory-worker and the editor of a local paper, he studied law and was admitted to the bar. After a period of service in the Massachusetts legislature, he was in 1853 elected to Congress, where for some time he was speaker of the house. From 1857-59 he was governor of Massachusetts, and later became president of the Illinois Central Railroad, which position he relinquished on the outbreak of the Civil War, when he joined the Federals. He held several commands, with varying success. He was defeated by Jackson at Fort Royal, and was later beaten at the battle of Cedar Mt. In 1863 he captured Port Hudson, but after his defeat at Sabine Cross-Roads in 1864 he was relieved of his command. He re-entered Congress in the same year, and served for many years as chairman of the Committee on Foreign Relations. A mental disorder brought about his final retirement from public life in 1891. He was popularly known as 'the Bobbin Boy,' in allusion to his early factory career.

Banks, Thomas (1735-1805), Eng. sculptor, was a native of Lambeth. Apprenticed at the age of fifteen to a wood-carver, he studied sculpture in the evenings under Scheemakers. He continued his studies at the Royal

Academy, where, in 1770, he gained the gold medal. In 1772 he gained a travelling studentship and proceeded to Rome. He did not return to England until 1779, his marriage to Miss Wooton, a lady of considerable means, rendering him independent. In 1781 he proceeded to Russia, where he gained the favour of Catherine II., who purchased his 'Cupid catching a Butterfly' and 'Caractacus and his Family before Claudius.' He was elected a member of the Royal Academy in 1785. B.'s greatest success was with imaginative subjects. Amongst his most notable sculptures are 'Achilles enraged for the Loss of Briseis' (Burlington House) and 'Thetis rising to comfort Achilles.'

Banks and Banking. The term 'bank' (derived from Fr. *banque*, a money-changer's bench or table) is applied to various forms of establishments which deal with money, including not only those institutions to which it more strictly applies, dealt with in this article, but also the great merchant and financial houses, discount businesses, and the like; it has even been wrongly adopted by mere money-lending and unauthorised stock-broking businesses. Banks have been classified into 'banks of issue,' *i.e.* those which have the right to issue their own notes, and 'banks of deposit,' those which receive money from their customers. Another classification divides banks into 'private banks,' those whose capital is owned by a limited number of partners, in English law not more than ten, and 'joint-stock banks,' where the shares are owned by a corporate body. In discussing banking in general, the English custom and practice is here taken as exemplifying the system at perhaps its most highly developed and organised stage. For practical purposes the Bank of England is the only Eng. bank of issue, and the notes of those banks which still preserve the right of issue are but rarely seen. The Bank of England notes are legal tender in England except at the bank itself. Though the banknote is of the greatest importance in regard to the reserves held against deposits by the banks and so ultimately in regard to the gold basis of our credit system, the cheque is the medium by which business transactions of every kind are now carried on. A bank, usually a joint-stock company, and with capital found by its shareholders, receives the money of its customers, either on deposit, *i.e.* only to be withdrawn after certain notice, or on current account, *i.e.* to be withdrawn on demand, during business hours. On deposit accounts interest is allowed, on current accounts usually none. The Bank of England allows no interest on deposits. These deposits, whether on deposit or current accounts, are the bank's liabilities, which they must be prepared to meet with cash on demand, and though in theory the liabilities might all be drawn upon at one moment, the system is based on actual experience that except in times of panic they never are. Thus the accumulation of deposits can be used by the bank for its own profit in financing the business and trade of the country, and expanding the credit on which it is built up. A glance at the yearly or half-yearly balance sheet of one of the great joint-stock banks will show the kind of business which is done by them. On the debit side will be found the paid up capital of its shareholders, *i.e.* the original working capital, the reserve fund, the accumulation of profits not paid out in dividends; then will follow the largest item, the deposit and current accounts of its customers, which form the bank's liabilities, and the profit and loss account. On the credit side comes first the cash: (1) Gold and notes in the tills, ready for the ordinary day to day drawings; these are normally small in amount, owing to the use of cheques; (2) cash held by the bank at the Bank of England, which, as the bankers' bank, is the centre of the English banking system. Cash held at the Bank of England appears as 'other deposits' in the weekly bank return. Next upon the credit side appears the item 'loans at call or short notice;' these are day to day or weekly advances made chiefly to the brokers of bills of exchange at a low rate of interest. The largest amount is found in the item 'bills discounted and advances.' Not only do the banks discount bills themselves, but they finance by advances the merchants who confine themselves to that business; thus the banks play an important part in the supplying of credit to the trade and industry of the country, for it is the bill of exchange (*q.v.*) which is the prin. medium of the supply of credit. 'Advances' also include the loans made by the bank to its customers, on securities of all kinds, from the large sums advanced to corporations, companies, bill-brokers, and discount houses, or to members of the Stock Exchange for dealings in shares, to the loans made to ordinary private persons on securities lodged with the bank or as overdrafts on personal security or guaranteed by a third person. The value of the bank's premises and investments made by it in the highest form of securities close the credit side of the balance sheet. An

examination of a bank's balance sheet will show that the deposit and current accounts, its liabilities, amount to perhaps six or seven times that of the cash in hand or at the Bank of England, and the balance will be chiefly found in the sums lent either at call or short notice, on bills, or in other advances, and sound banking depends on these advances being promptly repaid and securities easily and at all times readily realisable in cash. A bank has always to be prepared for a panic, and it is always faced by this problem: if too much is laid up in cash reserve against its liabilities, there will be so much less available for making its own profits and for the financing of trade and industry; if too little, at any moment it may be called on to pay more than it can command in cash at once, with the consequence of realising its securities at heavy loss or of even suspending payment. The cash reserves of a bank are, as we have seen, the gold and notes in its tills, and the reserve at the Bank of England, which is, in turn, a credit in the books of the bank, capable of being drawn on in gold or notes also. The ultimate reserve, therefore, is gold; for, as will be shown, the note issue of the Bank of England is restricted by law and depends on the gold held by it, except when the Bank Act is 'suspended.' A control is kept by the banks, therefore, on the expansion of credit by the varying rates of discount allowed in the money market, so that some equilibrium is kept between their liabilities and their reserves (*see* MONEY MARKET). Of all the vast business done by the banks, a very small proportion is actually carried on in gold or notes, for the commercial currency of England, and nowadays of the U.S.A., is the cheque. When A opens a deposit or current account at a bank, it is in nearly every case by means of a cheque, drawn in his favour by B on another bank against B's funds there; when A draws on his account to pay C, he again does so by a cheque, and C pays it into his account, and so on. The enormous amount of business done by the interchange of cheques is carried through not by paying in or out of notes and gold, but by book-entries in the various banks through the 'clearing house' (*q.v.*). A's cheque to C on X bank is taken off his current account and transferred to C's account at Y bank. The various banks at the clearing-house day by day balance all the cheques out and in against each other, and the differences are settled between them by a corresponding alteration in their accounts at the Bank of England, which is their common banker, and is not a member itself of the clearing-house. Similarly, when a loan or an advance is made by a bank, it usually consists of an entry in the bank's books, giving a credit against which the person to whom it is given has the right to draw cheques. Thus on a comparatively small capital of its own, with cash perhaps amounting to one-seventh of its liabilities, an estab. bank does its work of providing the readiest way of settling a vast volume of transactions, and of providing the credit necessary to finance these transactions with a currency which, though not actually paid in gold, is payable in gold. Some idea of the volume of business done can be gained from the fact that the annual amount dealt with at the London clearing-house reaches some sixteen thousand millions. As the keeper of the gold reserve, on which ultimately this vast business is built, and as the bankers' bank, the central figure is the Bank of England, of which a short historical sketch is given below. The Bank of England is first of all the gov. bank, receiving all revenue payments, and paying the dividends, etc., to holders of gov. stock. It is the agent of the gov. in the financing of treasury and exchequer bills, and in other ways is the right hand of the gov. in the financial side of its administration. It is the only bank whose notes are legal tender, *i.e.* must be taken in payment of a debt. It is, for all practical purposes, now the only note-issuing bank in England. The Bank of England, or, to give its proper title, 'The Governor and the Company of the Bank of England,' is directed by a governor, a deputy-governor, and twenty-four directors forming the court, and no member must be connected with other banks. The governor holds office for two years, after serving two years as deputy. The Bank of England is regulated by the Bank Charter Act, 1844. The act limited the note issue of all other banks in England and in Scotland and Ireland, but allowed the last two to exceed this, on an equivalent of gold for every note in excess. The monopoly of note issue in London and the 65 m. radius, granted in 1826, was retained, and no new bank could obtain the right; the result has been that many banks have allowed their note-issuing rights to lapse on opening offices in London, or from amalgamation with London banks. The act separated the Issuing and the Banking Depts. of the Bank of England. It could issue notes up to £14,000,000, being the amount of its loans to the gov. at that date, this is the 'fiduciary' issue; above that amount the bank must hold an

equivalent in gold coin or bullion. The fiduciary issue increased automatically by two-thirds of any lapsed issue of notes of other banks, and thus has been increased now to £18,450,000. The bank is obliged to make a weekly return, reporting its financial position. This is issued every Thursday, and will be found in the *Times* and other papers on the Friday following. An example is here given:—

BANK RETURN

An account pursuant to the Act 7 and 8 Vict. cap. 32, for the week ending on Wednesday, the 9th day of October 1912:

ISSUE DEPARTMENT

Notes issued	£54,868,020	Government Debt	£11,015,100
		Other Securities	7,434,900
		Gold Coin and Bullion	36,418,020
		Silver Bullion	—
	£54,868,020		£54,868,020

BANKING DEPARTMENT

Proprietors' Capital	£14,553,000	Goverment Securities	£13,338,084
Rest	3,159,682	Other Securities	32,855,496
Public Deposits [1]	10,357,468	Notes	25,697,095
Other Deposits	45,298,171	Gold and Silver Coin	1,495,465
Seven-day and other Bills	17,819		
	£73,386,140		£73,386,140

By deducting the notes in the banking dept. from the notes issued in the issue dept., the notes in circulation can be ascertained; most of them are held in bankers' tills as their immediate day to day cash transactions require. The notes held by the Bank of England in their banking dept. are the first line of defence against their prin. liability, that of 'other deposits,' which include the other banks' reserve, figuring in their balance sheet as 'cash at the Bank of England.' This with the bullion and coin is the Bank of England's reserve. In time of panic the banks will naturally draw against their deposits, and the Bank of England, not having an unlimited note issue, has to appeal to the gov. to 'suspend the Bank Act.' This has only been done in 1847, 1857, and 1866, and only in 1857 has an actual excess of notes been issued. The item on the debit side of the banking dept. termed the 'rest' is the equivalent of the 'reserve' in other banking balance sheets, viz. the undivided surplus of profits; this is never allowed to fall below £3,000,000. The Bank of England 'rate,' termed the "bank-rate,' is the official *minimum* rate [illegible] will above that for money in the open money-market; but if there is a shortness of cash, the tendency is for the open rate to equalise with the bank rate. *See* further EXCHANGE and MONEY-MARKET.

Banker and customer.—The English law affecting the relations between banker and customer is that of debtor and creditor, as was definitely laid down in the House of Lords in *Foley* v. *Hill*, 1848, 2 H. of L. 28. The banker is not a trustee, responsible to the depositor for the way in which he uses his money, and the banker keeps what profit he may make with the money deposited. If the bank stops payment, the depositor ranks with the other creditors. If he has not used his account for six years and there has been no payment of interest or repayment by the bank of any part of the deposit or no acknowledgment in the meantime, the debt is statute-barred. A banker is obliged to honour a customer's cheques provided only that there are sufficient funds to his credit, and is liable for damages without proof of actual injury or loss if he dishonours cheques. This liability holds good only between the banker and the drawee of the cheque, and the person in whose favour the dishonoured cheque has been drawn has no right against the banker. The banker's authority to pay money on cheques is ended by the customer's death, insanity, or bankruptcy, or by notice of an act of bankruptcy. A customer may by order revoke the authority to pay cheques or a particular cheque, but such order must be in explicit terms. A garnishee order against the funds of a customer at a bank attaches to all the funds, and a banker may not pay

[1] Including Exchequer, Savings Banks, Commissioners of National Debt, and Dividend Accounts.

on any cheques drawn by the customer, even if the amount of the judgment is exceeded by the funds. Valuables, such as plate, etc., deposited by a customer for safe custody with a banker, are not in the same position as funds deposited. The banker acts as a bailee, and they cannot be taken by the banker as set-off against a debt due from the customer, nor, in the case of the failure of the bank, do they rank with the bank's assets; the banker is liable for loss through negligence on his part, and they can be recovered from the banker after any lapse of time. The deposit of valuables for safe custody differs from the deposit of securities, for on these last the banker has a lien, which covers also all cheques and bills paid in for collection by the customer. The banker can retain all such against his customer's debt, and may realise the securities. This banker's lien can, of course, only be exercised where there is no agreement between him and the customer to the contrary, or where goods are deposited only for safe custody or money is paid in to meet particular bills. Further, a banker may not alter any system of dealing which has been recognised as holding good between him and the customer without due notice. If securities have been deposited as cover for a specific loan, the banker's lien terminates when the loan has been repaid. An overdraft or advance is arranged by agreement, and interest may be charged; a customer, drawing a cheque when there are not sufficient funds to meet it, makes an implied request for an overdraft, which the banker may refuse by dishonouring it. Much of the law affecting banker and customer is that which relates to cheques, bills of exchange, and other negotiable instruments. Finally, a banker is bound to keep secret all matters relating to his customer's account, unless authorised to do so or compelled to do so by law. *See* Paget, *Law of Banking*, 1908, and He

ets have been found in Babylonia and Assyria showing some of the functions of the modern banker, such as money-changing, advances, and the like; we also know from the code of Hammurabi that payments were made through a banker and by drafts against deposits. Deposits bearing interest, letters of credit, and other means of transferring credits from one place to another were also known in ancient Greece and Rome. The Chinese are said to have had a very early paper currency about A.D. 800. But though it is possible to trace the evolution of various functions of modern banking, especially in Italy during the middle ages, more or less continuously from very early times, it is now accepted that the first public 'bank,' properly so called, was the Banco di Rialto, estab. at Venice by acts of the senate in 1584 and 1587. In 1619 the Banco del Giro was founded; this became the only public bank in the state, and was long famous as the Bank of Venice. Banking in Venice developed out of the money-changers and private exchange bankers, who as early as 1318 seem to have taken deposits, and as far back as 1270 gave security to the state for the proper carrying on of their business. It was the failure of many of these deposit banks that led to the founding of the Rialto Bank as a public bank by the state. The Bank of Venice suspended payment several times owing to its loans to the state, and ceased after the Fr. invasion in 1797. An important early Italian bank was that at Genoa, the famous Bank of St. George; this was a private bank of deposit; it was definitely founded in 1407, and by its advances to the republic practically dominated the state and managed the public funds. The Fr. appropriated its property in 1800. The bank had a much earlier history, dating back to 1200, as a merchant and financial company, and is interesting as the first example of a body of shareholders whose liabilities were limited to their shares. The banks mentioned above were 'deposit' banks, receiving cash and paying it out on demand, and developed out of the business of the dealers in foreign exchanges. Another class of early banks were those which remained, at any rate principally, as exchange banks, of the utmost importance in the days when there was a large quantity of debased and clipped coin in circulation. Of these exchange banks the Bank of Amsterdam, founded 1609, lasted till 1820, and the Bank of Hamburg, 1619 till 1873, are the most famous. Their business lay 'in the assistance of commerce not by loans but by the local manufacture, so to speak, of an international currency' (Palgrave, *Notes on Banking*). This currency was 'bank money.' Merchants brought coin or bullion to deposit, and were credited with the real intrinsic value: their credit was in 'bank money,' which they could draw on to meet their requirements. The income of the bank was gained from the small charges for such transfers in the books of the bank as were made from one merchant to another to meet their dealings. There is a good account of the working of the Bank of Amsterdam in Adam Smith's *Wealth of Nations*, iv. ch. iii. The

next great step in advance was the appearance of the bank-note, *i.e.* a promise to pay in coin made by the bank which issued it. If these notes were backed by a general confidence in the bank issuing them, they would circulate as cash, and thus create a great expansion of credit and business with an economy of actual metal currency. The invention of the bank-note, apart, that is, from the Chinese paper money already alluded to, is due to Palmstruck, who founded the Bank of Sweden (Riksbank) in 1656; the first bank-note was issued from the bank in 1658. The further history and development of modern banking will be more conveniently discussed in the following sections dealing with different countries. *See* C. A. Conant, *History of Banking in all leading Nations*, 4 vols.; ibid. *History of Modern Banks of Issue.*

English banking and the Bank of England.—The rise of banking in England has often been dated from the seizure by Charles I. in 1640 of the bullion deposited in the Tower of London by the city merchants. Though it was returned to them, for the future they deposited it for safety with the goldsmiths, who not only did a great business in money-changing, but were also profitably employed in taking charge of rents and money on deposit from the country gentlemen, granting interest thereon. The goldsmiths had begun taking deposits in James I.'s reign, but the great development of their business dates from the Civil War. They gave receipts for the money deposited, and these receipts, known as 'goldsmiths' notes,' the earliest form of bank-note in England, circulated even more freely than coin, and large transactions were carried out by their means as late as 1696. During the Protectorate the goldsmiths were of great assistance in financing the gov., and after the Restoration they more and more became lenders to Charles II., and may be said to have had nearly all the state revenues in pawn, receiving as much as 12 per cent. or over, and paying less than half that rate to their creditors whose deposits they used. In 1672 came the suspension of exchequer payments, a declaration of national bankruptcy which brought ruin not only to the goldsmiths, to whom the gov. owed £1,300,000, but also to their depositors. The successful example of the Dutch banks, the demand for better security for deposits, a correspondingly safer form of paper currency than the goldsmiths' notes, together with a general lowering of the exorbitant rates of interest, charged in spite of the still existing laws against usury, still further the political necessities of the gov. in the matter of loans, all these factors contributed to the demand for the establishment of a properly regulated bank, a definite banking system, and the end of the goldsmiths. It is interesting to notice that three great private banks, Child's, Martin's, and Hoare's Banks, still carrying on business in the city of London, are descended from firms of goldsmiths mentioned in the London Directory of 1677. Smith's Bank at Nottingham claims to have been founded in 1688; it is now amalgamated with the Union of London Bank, under the style of the Union of London and Smith's Bank. Other early banks, now amalgamated with other firms, are the Bristol Old Bank, 1750, and the Hull Old Bank, 1754. Valuable and interesting information as to the goldsmiths' and early banking in England will be found in F. G. Hilton Price's *Handbook of London Bankers*, 1876; '*The Grasshopper*' *in Lombard* —— by J. Biddulph Martin, 1892. 6,140

of England: The proposal English foundation of the bank ca between William Paterson (*q.v.*), Mic of debtor frey, and other London me tely laid 1691. The actual founds in *Foley* place in 1694, by Act of P 2s. The the charter being granted sponsible to for twelve years, to 'The which he and Company of the Ban xer keeps land.' Sir John Houblon w with the governor, with Michael nk stops deputy-governor, and a ks with twenty-four directors. The has not was carried on in Grocers' ars and 1732, when the bank mov interest present site at the corner of of any needle Street, by the Royal E cknow- the present building, designe e debt John Soane, was erected in obliged part of the 19th century. Th es pro- holders of the corporation fficient subscribe £1,200,000, which ble for form their sole capital, and wi al in- taken as a loan to the gov. a ques. cent. with £4000 a year for management. The bank was a awee ised to deal in bullion and b in in exchange, and to issue notes up to amount of the loan; it was nque allowed to deal in pawned goods, nst merchandise, a privilege apparen not exercised. The restoration of the coinage, the attempt to found a rival land bank, and the gov.'s pressing need for money, led to the extension of the bank's privileges and capital by the acts of 1697 and 1709, especially in the strengthening of its monopoly, and interest was reduced to 6 per cent. No bank, whose members consisted of more than six, was allowed in England to borrow or take up money on its bills or notes payable

on demand. This was thought to be sufficient protection against competition, as at that time no bank could, it was supposed, do business without the power of issuing notes. No joint-stock banks were, in fact, founded. In 1722 the bank's reserve, called the 'rest,' was estab. In 1750 the rate of interest on the debt was converted to 3 per cent., the debt to the bank amounting then to over £11,000,000, and in 1751 the bank was given the administration and management of the national debt, which it holds to the present day. Further renewals of the charter were made in 1764 and 1781. From the attack on the bank during the Gordon riots in 1780 dates the protection of the premises by a military guard. In 1795 the first issue of £5 notes was made, and later, for a period, £1 notes. In 1797 cash payments were suspended by the Bank Restriction Act, owing to the general drain of gold and financial strain of the war; the bank's notes were thus made legally legal tender. The Bullion Committee Report was issued in 1810 safe guarded by parliament, and cash payments were not resumed till 1821. The banker issue of notes by the small dealing private banks, and the consequent holding failures, led to the Act of 1826, allowing joint-stock banks, *i.e.* those with unlimited number of partners, and with power of issuing notes; but they were forbidden to draw within 65 miles of London or within a radius of 50 miles. No notes were hence-forth issued in England below £5. Interest may be allowed on joint-stock banks without limit, drawings were allowed within the 65 miles radius; it may be noticed that the use of cheques had by this time become such that they act as substitutes for notes. The Bank of England notes ceased to be legal tender. In 1844 Peel's great Bank Charter Act, and other features of this Act, as Finally, regarding the bank's position at the present day, have been already given. The Act also confined the right of note issue to those banks which possessed the right before 1844; as each lapsed by failure or amalgamation, or became absorbed, the limit of the Bank of England was to the extent of two-thirds of the lapsed issue extinguished. The note-issuing powers of the joint-stock banks is of little importance at the present day, and the Bank of England note is practically the only circulating note in England. In 1862 companies with liability limited to the amount of their shares were allowed, and in 1879 unlimited companies formed before the Act of 1862 were allowed to adopt limited liability. Practically all the joint-stock banks availed themselves of this Act. *See* J. E. Thorold Rogers, *The First Nine Years of the Bank of England*; A. Andréadès, *History of the Bank of England*; F. Schuster, *The Bank of England and the State.*

Scotland.—The Bank of Scotland was founded in 1695 by Act of Parliament. It issued notes of £100 to £5, and in 1704 £1 notes. In 1727 a rival bank, the Royal Bank of Scotland, was granted a charter, and in 1746 the British Linen Bank. The private local banks ceased to exist by 1844, and Scotland shows an example of a small number of large banks with a highly developed system of branches, the number of offices to population being very high. The use of notes in business transactions is very great. The Act of 1844 fixed a limit to the issue of notes, beyond which the banks must hold specie: the banks of issue, now eight in number, carry on the whole business of the country. Scottish banking history is marked by the disastrous failures of the Western Bank of Scotland, 1857, which failed for nearly £3,000,000, and the City of Glasgow Bank, 1878, which resulted in a total loss of over £6,000,000. Both these were unlimited liability companies. The Scottish banks, in addition to those named, are the Commercial, National, Union, North of Scotland, and Clydesdale Banks. *See* A. W. Kerr, *Scottish Banking.*

Ireland.—The first public bank, the Bank of Ireland, was founded by Act of Parliament in 1783, with great restrictions on rival banks; banks of issue were limited to six members; in 1821 this limitation was removed, but only outside a 50 m. radius from Dublin. In 1845 this restriction was withdrawn. There are now nine joint-stock banks in Ireland, six being issuing banks. The regulations as to the issue is as in Scotland. All the six banks, with right of issue in 1844, still carry on business. The £1 bank-note, as in Scotland, circulates freely. The Irish banks issuing notes are the Bank of Ireland, Provincial, Northern, Belfast, National, Ulster; the Hibernian, Royal and Munster Banks have no note issue. *See* M. Dillon, *History of Banking in Ireland*

Banking crises and panics.—Since the Bank Act of 1844 there have been four banking panics and one financial crisis; the first, that of 1847, was the result of the great speculation in railways and a hazardous extension of credit. On Oct. 1 all advances on public securities were stopped, and the bank rate was 8 per cent. at the end of the month, when the coin and bullion reserve at the Bank of England fell to a little over £1,500,000. The Bank Act was suspended on the 25th, and though no notes above the limit were actually issued, the panic ceased, but there had been serious

failures of banks in Liverpool, Manchester, Nottingham, and the West of England. Over-expansion of credit and a great depletion of banking reserves led to the panic of 1857, when wild alarm prevailed, which continued even after the Bank Act was suspended on Nov. 12. On this occasion notes in excess of the limit were issued amounting to nearly £1,000,000, and the panic did not cease till the beginning of 1858. In 1866 the panic was marked by the historic failure of Overend, Gurney and Co.; it is stated that £4,000,000 in gold and notes was withdrawn from the Bank of England in one day; the rate was raised to 10 per cent. and the reserve fell to less than £500,000. The Bank Act was suspended, but no excess issue actually took place. The failures of the Scottish banks (*see* Scotland) and of the West of England Bank in 1878 caused great distress, but there was no general panic. In 1890 the failure of the great financial house of Baring (*see* BARING, family) resulted in a serious crisis, but it had little effect outside London and those directly interested in S. American investments, and whatever danger there was of panic was averted by the action of the governor of the Bank of England, Mr. Lidderdale, in securing £3,000,000 in gold from the Bank of France, and in taking over the liabilities. It must be remembered that London is the centre of the money markets of the world, and consequently has to bear an international as well as a national strain. This fact was marked in the New York and American panic of 1907 and 1908, when the necessary gold importation to the United States was conducted through London.

France.—In 1716 the celebrated John Law estab. the first bank of issue, Banque Générale, styled in 1718 the Banque Royale, the king guaranteeing the notes. It ceased to exist in 1721. Banks with limited issues carried on business, and there were attempts to reconstruct Law's bank. It was not till 1800 that Napoleon founded the Banque de France; at first its note issue was shared with departmental banks, which, however, were amalgamated with it in 1848, and it now is the sole issuing bank in the country. It has now over 400 branches, and does an enormous business in discounting bills and making advances. Its deposit business is not so large. The specie reserves of the Bank are very high, reaching £140,000,000 in gold and £40,000,000 in silver, against a note circulation of nearly £200,000,000. The note issue is limited by law, but as long as the limit is not exceeded, it has not to hold any specific quantity of bullion against it. The bank can, to protect its gold reserve, pay notes in silver; the bank rate is therefore very steady. The governor and the two deputy-governors are appointed by the State. Other large banks in France include the Comptoir d'Escompte, 1848; Crédit Lyonnais, 1863; Société Générale . . . du Commerce, 1864; the Crédit Foncier, 1852, chiefly deals in mortgages. There are a large number of provincial joint-stock banks.

Germany.—The Imperial Bank of Germany (Reichsbank) dates its present constitution from 1875; the Bank of Prussia was merged with it in 1876. It is very closely controlled by the gov.; the Imperial Chancellor appoints the president and council, and a proportion of its profits goes to the State. The right of uncovered note issue is limited by law, frequently extended, but the bank is permitted to exceed the limit repayment of 5 per cent. on the surplus. The Banks of Saxony, Bavaria, Würtemberg, and Baden also possess the right of uncovered note issue, but the amount is small in comparison with that of the Reichsbank. An important feature is the 'clearing' system (*Grio Verkehr*) of the Imperial Bank; a debt to a customer of the bank can be paid by paying the money at any of the numerous branches; it will be without charge transferred to the credit of his account. It amounts to a money-order business without expense, and serves as a substitute for cheques, which are not used to the same extent as in England. The private and joint-stock banks in Germany are chiefly engaged in financing the country's trade and industries, and important banks, such as the Deutsche Bank, have taken a prominent place in foreign and international finances.

United States of America.—The Bank of N. America was founded by Congress in 1781, and obtained a charter from the state of Pennsylvania in 1782. It continued business till 1863. A federal bank of the U.S.A. was incorporated in 1791; its charter was not renewed in 1811, but owing to the financial straits of the various state banks, a second bank of the U.S.A. was estab. in 1816; it ceased in 1841. The state banks were regulated by varying legislation, and exchange naturally rose and fell according to the financial position of the different states. The close of the Civil War brought with it a necessity for some uniform system, and the national banks were estab. in 1865. The special feature of this system is the issue of notes secured upon United States bonds deposited with the treasury at Washington. No

other banks have the right to issue notes, which, though not legal tender, are payable for all purposes except customs duties. National banks are bound to keep reserves up to 25 per cent. of their deposits in the 'reserve' cities; in smaller centres this is reduced to 15 per cent. There are over 6000 national banks in the U.S.A. State banks, private banks, and the trust companies, which are, practically speaking, banks, are not thus restricted. During the panic of 1893, 150 national banks suspended payment; the great panic of 1907 resulted in a suspension of all payments in currency. *See* W. G. Sumner, *A History of Banking in the U.S.A.*, 1896; J. J. Knox, *A History of Banking in the U.S.A.*, 1900. Other articles will be found under SAVINGS BANKS, LAND BANKS, PEOPLE'S BANKS, and PENNY BANKS.

Banksia, or honeysuckle-tree, is a genus of shrubs and trees of the order Proteaceæ, which are native to Australia, and receive their name from Sir Joseph Banks. They grow in sandy forest land or on rocks, and the flowers secrete a delicious honey; they do not produce good timber, but are cultivated in England for the dense heads of flowers. *B. compar* and *B. serrata* are tall trees, and *B. grandis* reaches a height of 50 ft.

Banks' Islands, a group of is. N. of the New Hebrides, in the Pacific. There are seventeen in all, the most important being Vanua Lava and Santa Maria.

Bankura: 1. Dist. Bengal, India. Area, 2621 sq. m. Pop. 1,120,000 (mostly Hindus). 2. Chief tn. of foregoing, 90 m. N.W. of Calcutta, on the R. Dhalkisor. Silk and cotton manufs. and trade in rice and oil-seeds. Pop. 20,000.

Bann, the name of two rivs. in the N. of Ireland, known respectively as the Upper and Lower B. The Upper B., 25 m. long, rises in the Mourne Mts. and flows N.W. into Lough Neagh. The Lower B., 40 m. long, issues from the N.W. corner of the same lough and flows N.N.W. through Lough Beg into the Atlantic, 4 m. S.W. of Portrush, dividing the counties of Antrim and Londonderry.

Bannatyne Club, a literary club founded in Edinburgh in 1823 by Sir Walter Scott and other Scottish antiquaries, notably David Laing, of the Signet Library, the club's first and only secretary, and Archibald Constable. It derived its name from George Bannatyne (1545-1609), the collector of the Scottish poetry of the 15th and 16th centuries. The club was formed for the printing of rare works relating to Scottish history, literature, and antiquities. It was dissolved in 1861. Sir Walter Scott was the first president. During its career the club was responsible for the printing of 116 works, some of which are much sought after by collectors.

Banner, a piece of drapery attached to the upper part of a pole or staff, generally hanging loose, but sometimes fixed in a slight framework of wood. To complete the idea, such piece of drapery must be regarded as in some way indicative of dignity, rank, or command, or as carried on some occasion with which ideas of dignity are connected. The size and form are mere accidents, as indeed is the material, though the drapery usually consists of some costly stuff, the most usual material being a soft silk called taffeta. Bs. are sometimes plain and of one uniform colour, but more usually ornamented with tassels and fringes, or decorated with some figure or device having reference to the person or community by whom it is raised, or to the occasion on which it is displayed. The term *standard* is usually applied to the prin. B. of an army, the national B., or a B. set up by some chief as a rallying-point for his adherents. *Colours* is the name applied to the Bs. borne by particular regiments. A *flag* is a B. displayed on board a ship, especially as a signal. A *pendant* is a narrow flag with a long streaming tail, used to denote the vessel which carries it to be a national vessel, or man-of-war. This is sometimes written *pennon*, and a small pendant is distinguished as a *pennoncille* or *pensil*. *Ensign* is a word formed on the idea of the B. displaying *insignia*, and formerly used where we now say *colours*. The officer now called an ensign was formerly the *ensign-bearer*. This name is now applied to the national colours carried over the stern of a ship. *Streamer* is a poetic word applied to all kinds of floating banners.

The national B. of England, that of her patron saint, St. George, consisting of a plain red cross upon a white ground, is a religious one; and whatever other Bs. were carried, this was, in former times, always foremost in the field. The *Union-flag* is formed by a combination with it of the crosses of St. Andrew and St. Patrick, the patron saints of Scotland and Ireland. The lions borne as the arms of England are the personal achievement or heraldic insignia of our kings, and appear from the time of Richard I. to have been always carried near the person of the sovereign when engaged in war.

The standard used in the 11th and 12th centuries, being too large to be wielded by a single hand, was sometimes fixed in a scaffold resting upon a car drawn by oxen, while at the foot of the mast a priest celebrated mass

every day, and ten knights, attended by as many trumpets, kept watch upon the scaffold night and day. Such a cumbrous machine was used at the great battle of the Standard, in the reign of Stephen.

While their chief use was as rallying-points, Bs. were also employed as signals from a very early period. They were also carried by heralds, and the pennon-quarrée of a B. formed, as now, the drapery of a trumpet. Bs., with inscriptions or intelligible devices, have been used in all popular insurrections, as a ready means of acting upon the minds of a multitude. In all pageants, at tournaments, coronations, and funerals, they have been extensively used; and corporations and trading companies still employ them.

Banneret, a higher rank of English knighthood conferred for distinguished conduct in the field of battle. Part of the impressive ceremony consisted in the changing of the knight's pennon for a banner. The last knight-banneret proper was Sir John Smith, who received the dignity from Charles I. for bravery at the battle of Edgehill.

Bannock (Gaelic *bannach*, a cake), a round cake, common in Scotland, made of pease or barley meal, or a mixture of the two. A *mashlum B.* is *one made of mixed meal. It is baked* on an iron plate known as a girdle.

Bannockburn (Gaelic, the stream of the white knoll), a vil. of Stirlingshire, Scotland, on the Bannock Burn, 3 m. S.E. of Stirling, the scene of the great battle, fought on June 24, 1314, in which 30,000 Scotch under Robert Bruce inflicted a crushing defeat on 100,000 Eng. under Edward II. The victory was largely due to Bruce's device of undermining the front of his position with pits covered with turf and rushes, into which the English cavalry were precipitated in helpless confusion. The Eng. are said to have lost 30,000 men. The 'Bore Stone' is still shown on which Bruce is reputed to have set up his standard. B. is to-day quite a thriving place, with manufs. of tweeds, tartans, and carpets, and other industries. Pop. 2500.

Banns, *see* MARRIAGE.

Banquette, in fortification, is a step formed of earth at the foot of the interior slope of a parapet (*q.v.*), extending along its whole length except where intervals are left for placing artillery to fire through the embrasures. Its height allows soldiers to fire over it, while it affords them almost complete protection.

Banshee, in Irish and West Highland folklore a guardian female fairy that by shrieks and wailings foretells the death of a member of the family over whose fortunes she watches.

Banswara, a hilly state in the S.W. of Rajputana, India; area, 1970 sq.m.; pop. 170,000. The cap., B., is situated 8 m. W. of the Mahi R.; pop. 8000.

Bant, a com. of Oldenburg, Germany, in the dist. of Jever, near Wilhelmshaven; pop. (1900) 16,126.

Bantam, a decayed seaport of Java, 40 m. W. of Batavia, situated in, and at one time the seat of gov. of, the residency of the same name. The residency has an area of 3050 sq. m. and a pop. of over 700,000.

Bantam Fowl, or *Gallus bankiva*, an ornamental variety of domestic fowl noted for its small size, silky appearance, brave and pugnacious disposition, which came originally from the E. It weighs little over a pound, and has fluffy legs; the hens are good layers, the flesh is good, and the eggs are of delicate flavour.

Bantayán, an is. belonging to the Visayas group, Philippines, in the prov. of Cuba, 60 m. from the tn. of Cebú. Area about 40 sq. m. It has pearl fisheries. Pop. about 13,300.

Banteng (*Bos sondaicus*), a species of wild ox, found in the Malay Peninsula and Archipelago. It resembles the gaur (*Bos gaurus*) of India, but it is of a lighter build, has a longer, sharper head, and more rounded horns. Like the gaur, it has no dewlap. The cow *is bright dun in colour, with white* legs and short hair. The back rises to a hump behind the neck. The B. inhabits jungles and forests, and is very ferocious. It has, however, sometimes been tamed by the Malays and interbred with the zebu. *See* Wallace, *Malay Archipelago*, 1869.

Banting System, a diet treatment advocated for the reduction of fat. The cure was first proposed by Harvey, and was practised by William B. (1797-1878), an undertaker of St. James' Street, London. At the age of sixty-six, and scaling over 14 stone, he denied himself bread, butter, milk, sugar, beer, soup, potatoes, and beans, and took in their stead meat, fish, and dry toast. By this treatment he reduced his weight by over 3 stone and his girth round the waist by 12½ in. B. wrote a pamphlet on the subject, entitled, *A Letter on Corpulence, addressed to the Public*, 1863, which ran into many editions.

Bantry, a seaport and tourist resort, co. Cork, Ireland, at the head of B. Bay, 50 m. W.S.W. of Cork. It has fisheries and textile manufs. The chief export is agric. produce. B. Bay, 25 m. long and 4-6 m. broad, affords fine anc
battle (
sent to
tion an
Herbert, in which engagement the Fr. gained the advantage. Pop. 3000.

Bantu, a term embracing the

widely-scattered African peoples speaking the languages of the B. group. They are distributed over S., S.W., and S.E. Africa, and include the Matabele and Mashonas in Rhodesia, the Zulus of Natal, the Bechuans (Basutos, etc.), the Damaras in the S.W., and further N. the Swahili. They are to be distinguished from the negroes of the Soudan to the N., and the Hottentots and Negritos in the S. The B. races came originally from N. and Central Africa. The word 'Bantu' (people) was first used in its present ethnographical sense by Max Müller.

Bantwa, a state in the prov. of Gujarat, India. Area, 208 sq. m. The chief tn., B., is 80 m. N.W. of Diu. Pop. 8600.

Banville, Théodore Faullain de (1823-91), French poet, novelist, and playwright, was a native of Moulins. His first vol. of verse, *Les Cariatides*, 1842, stamped him as a romantic, and was followed by *Les Stalactites*, 1846; *Odelettes*, 1856; *Odes funambulesques*, 1857; *Nouvelles odes funambulesques*, 1869, and *Idylles prussiennes*, 1871, this last inspired by the Franco-Ger. War. His *Traité de Poésie Française* is a valuable work on French versification, of which he proved such a dexterous master. His delightful handling of rondeaux, rondels, and other mediæval forms of verse was the starting-point of a notable revival in that kind of poetry. His play, *Gringoire*, has been played in England by Sir Henry Beerbohm-Tree. *See* his *Mes Souvenirs*, 1882.

Banyan Tree, or *Ficus indica*, is a species of Moraceæ, an order which includes many well-known plants, as



BANYAN TREE

the mulberry, fig, and india-rubber tree. The B. is a sacred tree in India, where it receives every care from the natives; it grows on an erect plant, and its roots hang downwards like thick supporting pillars. These trees often cover much space and grow to a great height. They produce gum-lac and caoutchouc, and the bark is used in Hindu medicine.

Banyuls-sur-Mer, Mediterranean watering-place and fishing vil. dept. of Pyrénées-Orientales, France, 21 m. S.E. of Perpignan by rail. The bathing attracts many visitors. Pop. 3000.

Banyumas, tn., Java, on the Serajo, 170 m. S.E. of Batavia. It is the cap. of the residency of the same name. Pop. 10,000. The residency has an area of 2140 sq. m., and a pop. of 1,270,000.

Banyuwangi, a seaport tn., E. coast of Java, cap. of dist. of same name. Pop. 16,000.

Banz, a small town situated in Bavaria, Southern Germany, nearly 4 m. S.W. from Lichtenfels, on the R. Main. Specially noted for its fine old castle, which originally was used as a monastery for the Benedictine monks.

Baobab, or *Adansonia digitata*, is a species of Bombacaceæ found in Africa and Australia. It is one of the largest trees known, having an enormous trunk, sometimes 30 ft. thick. Various parts of the plant have different uses, the bark having a strong fibre and being the chief ingredient of a febrifuge, the fruit (called *monkey-bread*) consisting of a pleasant though acid pulp and a juice which makes a cooling beverage, the leaves being of use medicinally and for food.

Bapaume, a tn., France, dept. of Pas-de-Calais, 12 m. S. of Arras. On Jan. 2 and 3, 1871, it was the scene of two fierce engagements between the Fr. and Germans, the former suffering a loss of over 2000 men. Pop. 3000.

Baphomet, the name of a mysterious idol with two heads, male and female, which the Templars were accused of worshipping in secret with licentious rites. The word seems to be a corruption of Mahomet.

Bapta, a genus of lepidopterous insects of the family Geometridæ. The species are among the thin-bodied, day-flying, delicate moths with large wings. *B. bimaculata* and *B. punctata* are both found near London; the former is white with two brown spots on the front edge of the anterior wings, while the latter has the tips of its anterior wings clouded with brown.

Baptanodon, a large ichthyosaurian, both amphibious and toothless, found in the Jurassic system of Wyoming. This fish-like reptile was from 9-11 ft. in length.

Baptism. The word itself is derived from the Gk. βαπτωμος, which signifies a ceremonial washing or purifica-

tion, and is in turn derived from βαπτίζω, which signifies 'to dip.' The ceremony is regarded as one of the sacraments of the Christian Church, and is a ceremony which consists of symbolic washing with water. The Christian Church refers it to the authority of Christ, who commanded its administration as part of His teaching. Many references may be found to it in the books of the N.T. The idea of a purification by washing with water, however, did not originate with the Christian Church. The Christians themselves recognised that this ceremony had formed an essential part of the religions of many of the ancients, and that the ritual of B. had been regarded as a purification for many sins. To give only one example, the Jews had regarded it as part of the ritual of the entrance of a proselyte into the Jewish Church that a formal purification should take place by B. A great controversy has always been in existence as to whether the sacrament of B. should be conferred only on adults who could profess their faith, or whether the sacrament could also be conferred on the children of Christians before they were able to answer and profess for themselves. The practice of the apostolic and early Christian Church was confined principally to the B. of adults, but probably this was due to the fact that the greater number of converts were adult proselytes from Judaism or heathen worship. The arguments brought to bear in favour of infant B. were principally that children had always occupied before the Christian era a recognised place in the Church, and that the new dispensation did not abolish that position. Also that from the words of Christ Himself it was obvious that children occupied a position in the Christian Church, and that B. of infants would occupy the same position as the rite of circumcision had in the Jewish ritual. On the other hand it was argued that there was no definite command or statement that infant B. should take place, and great emphasis was laid on the fact that the apostolic B. was confined almost entirely to adults. It was also held that the ceremony of adult B. was the result of corruptions which crept into the Church during the later period of the early Christian Church. No absolute historical proof could be brought forward by either side. It is, however, certain that for some very considerable time during the days of the early Christian Church, the ceremony of B. was confined almost entirely to adults, the age at which most Bs. took place being about thirty. In many cases it was much later, this being due to the fact that sin committed after B. was regarded as a sin against the Holy Spirit and unforgivable, therefore in many cases B. was deferred until death was felt to be near. The case of the Emperor Constantine may be taken as an example of this. Amongst the early fathers also there was considerable difference in the opinions expressed on the question of infant B. However, by the 2nd century it had crept into a fair part of the Christian Church, and by the 5th century was an established doctrine of the Church. The Roman Catholic and some of the Protestant churches recognise the rite of infant B., while, on the other hand, it was always feebly opposed by small sects during the pre-Reformation days and has been strongly opposed by a section of the Protestant Church since the Reformation. Another great controversy has ranged around the method employed in B. The methods adopted are two, immersion and aspersion. From irrefutable evidence we know that the second method was adopted in the very early days of the Church, but on the other hand, from many authorities the advocates of immersion are able to claim that immersion is the only true B. Advocates of immersion are without exception opponents of infant B., and while the upholders of aspersion recognise the validity of B. by immersion, the immersionists do no[illegible] of B. has r[illegible] Chris[illegible] able but that the ordinary method of B. has been by immersion. This question was one of the great separative forces in the quarrel between the Eastern and Western Churches, and although the Western Church ultimately adopted definitely the ceremony of aspersion for a considerable time, B. by immersion was the general method throughout Western Europe. The rite of B. was accompanied in the early Church, and is still in the Rom. and Oriental Churches, by a number of other ceremonies and forms. Most of these ceremonies, such as the signing of the cross on the infant's head, have been rejected by the Protestant Church, but the latter is retained by the Church of England. Amongst some sects there still exists the ceremony of the B. of the dead. The ceremony of giving a name during B. apparently crept in from the Jewish use at the rite of circumcision.

Baptist, John Gaspar, a painter, was a native of Antwerp, and a pupil of Boschaert. He came to England during the civil wars, and served in Lambert's army; but, after the Re-

storation, returned to his original profession, and was much employed by Sir Peter Lely in painting his draperies and backgrounds. He worked occasionally also for Kneller and Riley. He was not without original talent, and made designs for tapestries which evince considerable skill in drawing. There is a portrait of Charles II. in St. Bartholomew's Hospital by this artist. He *d.* in 1691.

Baptiste, Jean Baptiste Monnoyer (or **Monoyer**), *see* MONNOYER.

Baptistery, an ancient building, in which Christians performed the ceremony of baptism. The most celebrated existing Bs. are those of Rome, Florence, and Pisa; the most anct. is the B. of S. Giovanni in Fonte, near the church of S. Giovanni Laterano at Rome, commonly said to have been erected by Constantine the Great. The plan of this building is an octagon, with a small portico at the entrance; the interior is decorated with eight most beautiful porphyry columns, the finest of the kind in Rome. The diameter of this structure is about 75 ft. The B. of Florence, which is octangular, with a diameter of about 100 ft., stands opposite to the prin. entrance of the cathedral. The three great bronze doors are celebrated for the beauty of their bas-reliefs, and for the marble and bronze figures above them. The B. of Pisa, erected between the years 1152 and 1160 by Diotisalvi, is a singular design. The plan is circular, with a diameter of 116 ft.; the building is raised on three steps, and surmounted with a dome in the shape of a pear. The external elevation is divided into three stories.

The multangular edifices placed at the sides of cathedrals, which are called chapter-houses, are very similar in plan to the ancient B. It is possible that they were originally used for that purpose.

Baptists, a body of Christians who differ from other denominations in regard to the views which they hold concerning baptism. The distinctive view of the B. is that only believers should be baptised, and their method of baptism is also distinctive, viz. by immersion. The Pædobaptists, however, recognise the efficacy of baptism by immersion, and this method is still at the present day practised by a large portion of the infant-baptising Christian Church. The modern B. distinguish themselves from the Anabaptists (who are almost extinct) and reject any connection with them. They have their doctrines upon [illegible] apostles and the [illegible] that throughout Christian Church during the mediæval period their doctrines were maintained by the Cathari and the Albigenses. To trace the beginnings of the modern Baptist Church, however, and to separate this church from the Anabaptists, we come to the reign of James I. and to the work of John Smyth. John Smyth was originally an ordained minister of the English Church who broke away from that church and fled to Holland. Here he fell under Mennonite teaching, and after severing his connection with the Independents, whom he had joined, he issued a confession of faith for the first Eng. Baptist Church 'of English people remaining in Amsterdam in Holland.' This declaration of faith definitely laid down the two main doctrines of the Baptist Church, 'to receive all their members by baptism upon the confession of their faith and sins,' and that 'baptism in no wise appertaineth to infants.' Smyth died in Holland, but his chief follower came to England in 1612, the year of Smyth's death, and estab. his little church in Newgate. This was the origin of the 'General' Baptist denomination in Great Britain. The General Baptist denomination strongly repudiated the Calvinistic doctrines, holding equally strongly to the doctrines of the Arminians, and maintaining the doctrine of universal redemption. The beginning of the Particular Baptist Church in England may be traced to the Jacob Church in Southwark, and its foundation may be approximately dated as taking place in the year 1633. Of this Jacob Church the famous Praise God Barbon was a member. The Particular Baptist Church was the direct offshoot of the Independents, and was therefore naturally Calvinistic in doctrine. Both sections of the Baptist Church suffered persecution during the reign of Charles II., but the passing of the Toleration Act of 1689 gave liberty of worship and freedom from persecution to the B. together with all other Dissenters. The B. continued in this divided state for some very considerable time—the Arminian section, who held the doctrine of a general redemption, being known as the General B., and the Calvinistic section, who held the doctrine of a particular redemption, being known as the Particular B. A schism took place towards the end of the 18th century in the ranks of the General B., and a General Baptist New Connection was formed, the old connection being Unitarian. The names General and Particular B. gave rise to the impression that the General B. were those who admitted to their communion members who professed faith in Christ but did not agree with their views on baptism, and Parti-

cular as those who clung jealously to their own doctrines and refused admission. This idea, however, is entirely wrong, the names applied respectively to convey that idea being 'open B.' and 'strict B.' In 1891 the two sections of the B. were united *together into one body*, known as the 'Baptist Union of Great Britain and Ireland.' This union was due principally to the efforts of the Rev. John Clifford. The method of church gov. is congregational, the officers of the church being the pastor, the deacons, and evangelists. Each church is self-governing, and is subject to no external pressure at all. The B. have a magnificent missionary association, and also a number of colleges for the training of young men for the ministry. These seminaries are scattered throughout the country, and are the means of doing very good work. At the present day the B. have members in every part of the world in which white men are found, and their numbers are increasing annually. In the U.S.A. there are over 6,000,000 B., and the total number of churches possessed by the B. nowadays is nearly 100,000 with a total number of members that is nearly 9,000,000.

Bar: 1. In geography, a shoal of sand, gravel, or earth formed at the mouth of a riv., where the force of the stream is so checked by the sea water as to allow the mud, etc., suspended in the riv. water to settle. Under such conditions navigation becomes difficult, and must be assisted by dredging. 2. In music, the perpendicular line drawn across the lines of the stave to divide the music into equal portions and regulate the accent. The portion between two Bs. is frequently but incorrectly referred to as a B. 3. In heraldry, an *ordinary* in the form of the *fesse*, from which it differs by its narrowness and by its position in various parts of the shield, the *fesse* being confined to a single place. It has two diminutives, the *closet* and the *barrulet*, one-half and one-fourth of its width respectively. 4. In law, the term B. has various *significations*. It is used to denote collectively those members of the legal profession who have the right to plead on behalf of suitors. It is also applied to the enclosed space in a court of justice where such members of the profession may plead, and to the prisoner's dock. A peremptory exception sufficient to stop a plaintiff's action either temporarily or permanently is also termed a B.

Bar (formerly Rov), a tn., *Podolia*, Russia, 50 m. N.E. of Kaminetz, on the Rov, an affluent of the Bug. An anti-Russian conspiracy of the Polish nobles, known as the Confederation of B., was formed here in 1768. Pop. 11,000.

Bar, Trial at, a form of trial, in Eng. legal procedure, before a full bench of judges. It was the usual mode of trial prior to the writ of *nisi prius* (Statute of Westminster, 1285), and is now the *only* survival of the old procedure. Such a trial takes place in the King's Bench Div. before a bench of judges and only in cases of great importance, or when demanded on behalf of the crown by the *attorney-general*. The trial of Colonel Arthur Lynch for high treason, 1904, and the hearing of the petition of right, 1905, to decide the responsibility of the British government for claims against the Transvaal Republic for acts done by it before or during the S. African War, took place 'at B.'

Bar Council, or, more fully, the 'General Council of the Bar,' is the accredited representative body of the Eng. Bar: its functions are to act in a consultative and advisory capacity, dealing with all matters affecting the profession, such as the proposal and criticism of *legal reforms, matters of* practice, conduct, etiquette, etc. The body consists of the attorney-general and solicitor-general for the time being, the ex-attorney and solicitor-generals, together with forty-eight selected members of the Bar, not less than twelve 'inner' barristers (King's Counsel) and not less than twenty-four 'outer' barristers (juniors). The General Council was estab. in 1895, and replaced the Bar Committee, established 1883.

Baraba, an immense Siberian steppe, in the govs. of Tomsk and Tobolsk, between the rivs. Obi and Irtish, estimated to occupy an area of 100,000 sq. m. It is covered with marshes and salt lakes.

Barabanki, a dist. in the United Provs., N. India. It is a marshy plain traversed by the rivs. Gogra and Gumti. Area about 1703 sq. m. The soil is fertile, and wheat, rice, and grain is grown to a considerable extent. Pop. 1,180,000. The cap. is Nawabgunj, also known as B., which is 15 m. E. of Lucknow, and has a pop. of 15,000.

Barabbas, or **Barabas** (Aram., son of the father), the name of a robber mentioned in the N.T. who was released instead of Christ by Pontius Pilate at the desire of the Jews.

Barabinza Steppe, *see* BARABA STEPPE.

Baraboo, the co. seat of Sauk co., Wisconsin, U.S.A., on the B. riv., and on the *Chicago and North-Western* Railroad, 37 m. N.W. of Madison. It [illegible] ated 3 m. N. of [illegible] above the sea. railroad-shops.

and a fruit-canning factory, etc. Pop. (1905) 5835.

Barabra, or **Berabera**, the name given by the modern Egyptians to a people of Lower Nubia, who call themselves Kenouz. The country occupied by the Kenouz extends along the Nile, between the cataract of Wady Halfa and that of Assouan. The B. or Kenouz are said by Champollion and others to resemble in features the people represented in the anct. Egyptian sculptures. (Balbi, *Géogr.*). *See* NUBIA.

Baracoa, a seaport at the E. end of Cuba. The cap. of the island from 1512-14, it is now the centre of the banana and cocoanut export trade. Pop. 2900.

Barada, a riv. of Syria, which rises in the Antilibanus; at Damascus it divides into two branches, the one flowing N. being the Pharpar, now called Awaj. The other branch, the main B., is supposed to be the Abana of anct. times, called by the Greeks Chrysorrhoas. It waters the gardens of Damascus, and finally empties itself into the Lake Bahret-el-Ateibeh.

Baraguay d'Hilliers, Achille, Comte (1795-1878), son of Louis Baraguay d'Hilliers, a marshal of France, was born at Paris; was a soldier almost from childhood: had his left hand carried away by a cannon-ball at the battle of Leipzig. He took part in the Spanish and Algerian campaigns, and was promoted to the rank of lieutenant-general. He was sent on a mission to Rome by Louis, commanded the Baltic expedition, took Bomarsund in 1854, and won the battle of Melejuana in 1859. He died at Amélie-les-Bains.

Baraguay d'Hilliers, Louis (1764-1812), a Fr. general, was born at Paris. He served under Crestine, and was arrested with him, but re-entered the army and distinguished himself under Bonaparte in Italy. He took part in the ill-fated Russian campaign, and having been made prisoner, when released was ordered by Napoleon to return under arrest. He died at Berlin on his way back.

Barahat, formerly cap. of the Raja of Gurwal, is situated on the N.W. bank of the Bhageerettee, in Northern Hindustan, in 30° 45′ N. lat., and 78° 22′ E. long. This tn. suffered very severely in 1803 from an earthquake, in which 300 of the inhab. were killed. It was described in 1815 as having not a dozen houses standing in a properly habitable condition, and as being almost buried in a jungle of rank weeds; but it has since recovered something of its former importance owing to the numerous pilgrims who used it as a starting point for the sacred source of the Ganges. Srinagar, now the largest place in the province, is distant 48 m. N.N.W. from B. Pauri is the seat of administration of Gurwal.

Barahona y Soto (1560-90), Spanish poet, whom Cervantes praises highly in *Don Quixote*. He wrote a continuation of Ariosto's *Orlando Furioso*, the first part of which bears the title *The Tears of Angelica*. He also wrote satires, eclogues, epistles, etc.

Baralipton, *see* SYLLOGISM.

Baranetz, Scythian or Tartarian lamb, is the woolly rhizome of *Cibotium Barometz*, a species of Cyatheraceæ. *See* BAROMETZ.

Baranov, Baranof, or Sitka Is., the most important is. in the Alexander Archipelago, Alaska, U.S.A. It is about 100 m. long, and its greatest breadth is 25 m. Coal and deposits of placer-gold are found on it, and there are fisheries along the coast. The cap., Sitka, is on the N.W. coast, the pop. of which was estimated in 1905 to be 1150.

Barante, Baron Guillaume Prosper Brugière de (1782-1866), a Fr. historian and politician, was born at Riom. He is the author of a history of the Burgundian dukes, the excellence of which caused him to be elected a member of the French Academy. He died at Barante.

Baranya, a co. of Hungary, lying between the Danube and the Drave. Area, 1982 sq. m. Pop. 322,000. To the E. stretch the Szöllös, a range of heights between Monostar and the Danube. The soil is very fertile; the greater part of the land is cultivated as vineyards, while some is used as arable land. Wheat, grain, tobacco, fruits, and vegetables are grown. The cap. is Fünfkirchen (Pécs).

Barasat, a tn. in Bengal, 12 m. from Calcutta; pop. about 10,000.

Baras Khotun, or Bars Khotan, the City of the Tigers, formerly a large tn. on the banks of the Kherlon, in the country of the Mongols; the ruins of the tn. lie, according to Father Gerbillon, the only European who ever visited them, in 48° N. lat. and 113° 42′ E. long. When this traveller passed the riv. near these ruins, they consisted of extensive remains of mud walls, and two pyramids in a state of decay. After the Moguls had been defeated and expelled from China, Toghon Timur, the Mogul emperor, built this tn. as the future seat of the empire, and he died there in 1370. At that time it was an extensive tn., nearly 7 m. in circumference. Nothing certain is known respecting its destruction. Timur's son transferred the seat of the empire to the anct. tn. of Karakorum, farther to the W.; and this circumstance was probably the chief cause of its abandonment and final destruction. (Du Halde; Ritter's *Asia.*)

Barataria (Spanish *baralo*, cheap): 1. The so-called is. in *Don Quixote* (pt. ii. ch. 42-53) over which Sancho Panza was appointed governor. 2. A bay on the W. side of the Mississippi Delta, which the notorious Jean Lafitte (1780-1826) and his band of pirates, smugglers, and slaves made their headquarters. Their band was broken up by Commander D. T. Patterson, of the United States Navy, 1815. *See* vol. x. of *The Magazine of American History* (New York, 1885). 3. The imaginary kingdom in the *Gondoliers*, by Gilbert and Sullivan (1889).

Baratier, Jean Philippe (1721-40), a precocious boy genius, born at Schwabach, near Nuremburg, was the son of Francis B., pastor of the Fr. Protestant church at Schwabach. Before he was five years old he could speak Lat., Fr., and Ger., and could read Gk. At the age of six he began a three years' course of Hebrew study, reading with great avidity the books of the Cabbalists, Talmudists, commentators, etc. At nine he collected materials for a dictionary of rare Hebrew and Chaldaic words, with philological notes, and about two years later translated into Fr. from the Hebrew Benjamin of Tudela's *Itinerarium*, to which he added eight dissertations. He took his M.A. at Halle at the age of fourteen and was received into the Royal Academy at Berlin. He then studied law as a matter of duty, after which he turned to history, philology, and antiquities. He began a *History of the Three Years' War*, a *History of the Heresies of the Anti-Trinitarians*, and an *Inquiry concerning Egyptian Antiquities*, but he died before he reached the age of twenty. His life was written by Mr. Formey (Halle, 1741).

Baratieri, Oreste (1841-1901), an Italian general, born at Condino, in the Tyrol. He served under Garibaldi in Sicily, 1860; was appointed governor of Eritrea, in Africa, 1891, where he adopted an aggressive policy, and, advancing into the interior, captured Kassala, 1894. In the following year he twice defeated Ras Mangasha, but was put to rout with great loss of life to his men by the army of Menelek near Adowa, 1896. He was tried before a court-martial and was censured, 1897; he left the army the same year, and published his defence, *Memorie d'Africa*, 1892-6 (1897).

Baratynski, Eugène Abramovitch (1792-1845), a Russian poet. He at first entered the military service, but quitted the army in order to devote himself to poetry. He was considered by his friend Pouchkine to be the best elegiac poet of Russia. He died at Naples.

Barava, Barawa, or Brava, a seaport of Somaliland, E. Africa. Pop. about 4000.

Barb, the name of a fine breed of horses, reared by the Moors of Barbary and Morocco and introduced by them into Spain. They are not remarkable for beauty or symmetry, but their speed, patience, and endurance is unrivalled. The most celebrated horse of this breed is 'Godolphin Barb,' which belonged to the Duke of Leeds (of the Godolphin family), and died in Dec. 1753, at the age of twenty-nine. Nearly every Eng. racehorse of note has a strain of the blood of this animal.

Barbacan, *see* BARBICAN.

Barbacena, a tn. Brazil, in the state of Minas Geraes, on the W. slope of the Serra Mantiqueira, 130 m. N.W. by N. of Rio de Janeiro. Elevation about 3700 ft. above the sea. Pop. 6000.

Barbacoas, a tn. in the dept. of Cauca, S.W. of Colombia, 140 m. N. by E. of Jinto, on the Telembi, a trib. of the Patia, and navigable from the sea. Pop. 6000.

Barbados, or Barbadoes, is the most easterly of the W. India Is.; it is 21 m. in length and about 14 m. in breadth. Its area is 106,470 ac., of which practically all that is not occupied by buildings is under cultivation. Bridgetown is the cap., situated in lat. 130° 5' N., and long. 59° 41' W. The time of its discovery is not definitely known, but it is first mentioned in 1518, and was occupied by the British in 1625. The island is low-lying, with a broken surface, the highest point, Mt. Hillaby, reaching 1145 ft. There are no forests on it now, and few rivers; it is very highly cultivated, sugar being the chief product. The island is divided into eleven Church of England parishes, and is the see of the Bishop of the Windward Isles. The climate is as a rule very warm, though the warmth is moderated by the N.E. trade winds, particularly from Jan. to May. The island is well furnished with such conveniences as trams, a railway, telephones, etc. It has an executive and legislative council and a House of Assembly. The old foundation made a liberal provision for education, which is supplemented by an annual vote. B. is the trade mart for the Windward Isles, and the headquarters of the British forces of the W. Indies. The chief exports are molasses, rum, and sugar: the chief imports rice, salt, corn, butter, and flour. The island is thickly populated, the pop. in 1901 being 196,000, or 1200 to the square mile.

Barbados Cherry is a name applied to the fruit of the *Malphigia urens* and *M. glabra*, the latter resembling closely a cherry in size and appearance,

but not in flavour. They are found in the West Indies.

Barbados Gooseberry, the fruit of the *Pereskia aculeata*, is an oval, yellow, edible fruit which grows on a W. Indian cactus. The plant on which it grows has thick, flat leaves with hard spines and the flowers are showy and white.

Barbados Leg, another name for *Elephantiasis Arabum*.

Barbara, in formal logic, is the first word of a useful and ingenious set of mnemonic lines which form a clue to the moods and their process of reduction in all the four figures. *Barbara* itself indicates that mood of the first figure which has all its propositions universal affirmatives. The lines are:

Barbara, Celarent, Darii, Ferioque prioris:
Cesare, Camestres, Festino, Baroco, secundæ:
Tertia, *Darapti, Disamis, Datisi, Felapton,*
Bocardo, Ferison, habet: Quarta insuper addit
Bramantip, Camenes, Dimaris, Fesapo, Fresison.

Barbara, St., a virgin martyr and saint of the Roman Catholic Church, who suffered martyrdom at Nicomedia in Bithynia in 240 or 306. She was converted to Christianity and her father on hearing this beheaded her. She is regarded as the patron saint of gunners and locksmiths. Festival Day December 4.

Barbarea, a genus of perennial herbs of the order Cruciferæ, which are found in Europe, Asia, and America. *B. vulgaris*, yellow-rocket, winter-cress, or herb St. Barbara, grows in Britain as a handsome border-plant in gardens, and is used in spring salads. *B. præcox*, early winter cress, is common to France, Britain, and N. America.

Barbarian (from Gk. *βάρβαρος*, Lat. *barbarus*). The word was introduced into the Greek tongue to describe all peoples that did not speak the language of Greece. The word is probably onomatopœtic, since it represents the strange babble of the foreign tongue to the more highly cultured Gk. To the Gks. the whole world was divided merely into Hellenes and Bs. The Roms. were included by the Gks. in this general classification. At a later stage in the world's history, when Rome had risen to power, the word was used to signify such peoples that did not share the culture and civilisation of Rome. The whole of the world outside the boundaries of the empire was barbaric. Gradually the word ceased to denote only a difference of tongue, and came to mean a difference of manners, custom, and culture. To the cultured and daintily nourished Rom. citizen the B., the man who spoke a different tongue, also lacked the manners and culture of Rome, and so the whole came to denote a lack of civilisation and culture. The tribes that were the essential cause of the downfall of Rome, were barbaric, and so we find historically that the B. attacks upon the city of Rome are always referred to. For a long time the Roman decadence had been bolstered up by the fresh infusions of barbaric vigour, and gradually the Bs. came to realise the power which they wielded, and when this realisation was fully accomplished, Rome fell. The attacks of the Huns, the Goths, and the Vandals were but the prelude to the disintegration of the empire. The greatest triumph may be said to have been won by the B. Odoacer, when in 476 he deposed the young emperor, and became to all intents and purposes king of Italy himself. He in turn was soon to be deposed and slain by the B. Theodoric. At this period nearly every part of the empire fell or was shortly to fall into the hands of the Bs. Spain owned the rule of the Visigoths, N. Africa of the Vandals, Italy of the Ostrogoths, and Gaul of the Franks. The vigour of the Bs. was too great to be held in check by the vanishing glory of the Rom. tradition. In the modern sense the word is applied almost exclusively with the meaning of lacking in culture and civilisation. Anything rough, savage, and uncouth is said to be barbaric, and the possessor of such qualities is held to be a barbarian.

Barbarossa, *see* FREDERICK I., EMPEROR OF GERMANY.

Barbarossa Aroodje, *see* BARBAROSSA, HORUK.

Barbarossa, Horuk and Khair-ed-Din, the name of two Turkish corsairs who were the terror of the Mediterranean during the early part of the 16th century. Horuk, or Aroodje of Orooch, was born at Mitylene *c.* 1474. He served the emir of Tunis and became commander of his fleet. In 1515 he took Algiers, but three years later the Arabs secured the help of Spain, and Horuk was defeated and slain by General Gomarez, near Oran. The younger brother, Khair-ed-Din, thereupon took command, and with help from the Sultan Solyman II., he took possession of Algiers (1519) and Tunis (1533). In 1536 he was appointed chief admiral of the Turkish fleet, and carried on his piracy up and down the Mediterranean, both on land and at sea, plundering Port Mahon (Minorca), the Ionian Is. and Dalmatia and defeating the Christian powers in several sea-fights. He obtained victories over the fleet of Emperor Charles V. in the Gulf of

Arta (1538), near Crete (1540), and off Algiers (1541). In 1543 he gave his aid to the French in the capture of Nice, and made a triumphal return to Constantinople, where he died in 1546. *See* Rang and Denis, *Histoire de Barberousse*, 1837; La Gravière, *Doria et Barberousse*, 1886; and Lane-Poole and Kelley, *The Story of the Barbary Corsairs*, 1891.

Barbaroux, Charles Jean Marie, a Fr. politician, was born at Marseilles in 1767. In his early years he studied the physical sciences, but his ardent and impulsive nature caused him to throw in his lot with the revolutionary movement at its outset. He directed the movement in his native town, and was sent to Paris to bear a complaint to the legislative council against the director of his dept. He was present on 'Aug. 10,' and added to the success of the day by bringing up a battalion of volunteers. He allied himself with the chief of the Girondin party, and on being elected as a member for the dept. of Bouches-du-Rhône, he sat with that party. He distinguished himself by his fanatical oppbsition to Robespierre. On June 2, 1793, he refused to submit, and went to Caen to organise the Girondin resistance there, but was obliged to flee before the troops of the convention. He reached Bordeaux, but was there overtaken and made prisoner, after an ineffectual attempt to shoot himself. He was guillotined on July 25, 1794.

Barbary is the general name for the most northerly portion of Africa, from Egypt to the Atlantic, and from the northern frontier of the Sahara to the Mediterranean. It thus includes Morocco, Fez, Algeria, Tunis, and Tripoli, together with Barca and Fezza. The name B. is derived from the name of its anct. inhab., usually called 'Berbers' or 'Kabyles.' In anct. times, this part of Africa was under the dominion of Carthage, and was exceedingly prosperous. After the fall of Carthage, it was under Rom. rule, had many flourishing cities, and was regarded as the prin. granary of Rome. After being overrun by the northern barbarians at the fall of Rome it was subdued by the Saracens and flourished under their rule as much as at any period of its history. But the Saracenic government gradually became a prey to disorder and B. sank into a very degraded condition. A small number of Turks and renegades acquired it, and subjected it to the most brutal despotism. Since they could not compete with the European powers in war, they carried on an extensive system of marauding; and the 'B. Pirates' were the terror of the merchants of the region. They were suppressed finally at the conquest of Algiers by the Fr. The occupants of B. are principally Bedouins, Jews, Turks, and the Fr. colonists in Algeria. For a fuller description of the climate, produce, etc., *see* the various countries comprised in the name Barbary.

Barbary Ape, the *Macacus inuus*, belonging to the family of Primates, Cercopitoecidæ, is the only monkey found alive in a wild state in Europe. It is tailless, an agile tree-climber, and feeds on fruit. It is a native of N. Africa and the Rock of Gibraltar.

Barbary Pirates, *see* BERBERS.

Barbastelle, a species of bat, found in England, France, and Germany, with hairy cheeks and lips.

Barbastro, the chief tn. of a very fertile dist. of the same name, in the prov. of Huesca, in Aragon. It is situated on the Vero, which is crossed by stone bridges. B. is the seat of a bishop, and has a pop. of 7000.

Barbauld, Anna Laetitia (1743–1825), the only daughter and eldest child of John Aikin, D.D., was born at Kibworth, in Leicestershire. She was a precocious child, but was of such a modest and retiring nature that it required the importunities of her brother to cause her to pub. the first of her works. This was a vol. of poems, which met with an instant success on its appearance in 1773, going into four editions in the first year. In the same year a vol. of *Miscellanies* in prose and verse, by J. and A. L. Aikin, was pub. In 1774 Miss Aikin married the Reverend Rochemout B., a Fr. Protestant whose family had settled in England in the time of Louis XIV. They removed to Palgrave in Suffolk, where Mrs. B. wrote her *Hymns in Prose for Children*, her best work. In 1785, after travelling for a year, they removed to Hampstead, where they remained until 1802, when they went to Stoke Newington. Mr. B.'s mind, which had never been strongly balanced, gave way entirely, and he died insane in 1808. Mrs. B. continued to live and work at Stoke Newington until her death. The original of Macaulay's 'New Zealander' is to be found in her work entitled '1811.' Her works as a whole are distinguished by poetic talent, a graceful style, and lofty principles.

Barbecue, derived from the Spanish word *barbacon*, was the name given to a framework placed over a fire, on which was placed meat, etc., to be dried or smoked. Later the framework developed into a large kind of gridiron on which whole animals could be roasted. In Cuba B. is used for the upper floor of a house, where grain, etc., is stored, and in the

United States it is used to denote an open-air feast on a large scale.

Barbed is the term used in heraldry for an arrow with a pointed or jagged head; also for the five green sepals which appear between the five petals of the conventional heraldic rose.

Barbed Wire Act, 1893, an act which enables a local authority to serve notice in writing requiring the occupier of land adjoining a highway to abate the nuisance caused by barbed wire fencing if it be likely to cause injury to persons or animals lawfully using the highway. If he fail to abate the nuisance, a court of summary jurisdiction, on application by the local authority, may order him to do so, and on failure to comply, the authority may execute the order and recover the cost from the occupier.

Barbel (Lat. *barba*, beard), the common name applied to the genus of fish known as *Barbus*, of the family Cyprinidæ, allied to the carp and gold-fish. It has four soft appendages from its mouth, and the third ray of the dorsal fin is long, bony, and serrated. It lives in fresh, usually muddy, water in Asia, Africa, and Europe. *B. vulgaris*, common to Europe, is a large, coarse fish, weighing fifteen to eighteen pounds.

Barber (Fr. *barbe*, a beard) is one who is occupied in shaving, hair-dressing, and trimming the beard, etc. In former times the Bs. were joined with surgeons, and had a much higher position. In France the barber-surgeons were a distinct body under Louis XIV., and in England the Bs. were incorporated in 1461. They were united with the company of surgeons in the time of Henry VIII., and were allowed to let blood and to draw teeth; they were not separated from the surgeons until 1745. The fillet round the B.'s 'pole' signifies the ribbon which was bound round the arm before bleeding.

Barberini, an Italian family, originally from Florence, which was raised to a high rank among the Roman nobility in consequence of the elevation of one of its members, Cardinal Maffeo Barberino, to the papal chair in 1623, when he assumed the name of Urban VIII. (*See* URBAN VIII.) Urban had three nephews, two of whom were made cardinals, and the third prefect of Rome, and they ultimately, after some vicissitudes, became possessed of the fief of Palestrina, which had formerly belonged to the Colonna family. The B. have ever since ranked among the first Roman nobility, several individuals of their name having been successively raised to the rank of cardinals, while the lay representative of the family bears the title of Roman prince, and is possessed of estates at Palestrina, Albano and in other parts of the Rom. state. In the palace of the B. at Palestrina is the celebrated mosaic taken out of the Temple of Fortune of Prænestе. (*See* PALESTRINA.) The palace B. at Rome is a vast structure, built by Bernini, and gives its name to the square before it. It contains a museum, a gallery of paintings, and a library, which was collected by Cardinal Francis B., one of the nephews of Urban VIII. The library is rich in valuable MSS.; its catalogue was printed at Rome in 1681, in 3 vols. folio. There is also a fine villa, with extensive gardens, belonging to the same family, at Rome, near the Thermæ of Diocletian, and another in the neighbourhood of Albano.

Barberini Vase, *see* PORTLAND VASE.

Barberino di Mugello, a tn. in Italy, 15 m. N. of Florence, on the Sieve. It manufs. straw hats. In the neighbourhood is the villa of Caffegiolo, the anct. residence of the Medici. Pop. of commune, 11,379.

Barberry, or *Berberis vulgaris*, is a species of Berberidaceæ which is frequently found in Britain. The leaves of the shoot appear as spines having in their axils dwarf shoots which bear foliage-leaves and flowers. The flowers grow on a long, pendant stalk; the berry is oval, and is sometimes made into jam. The presence of B. plants is productive of the fungus called rust which develops on grasses.

Barber-Surgeons, *see* SURGEONS, COLLEGE OF.

Barberton, a mining town of the Transvaal, situated 2830 ft. above sea-level on a side of the De Kaap valley. Owes its importance to the discovery of gold in the De Kaap valley in 1886. It is connected by rail with the Lourenco Marques-Pretoria trunk railway. During the Boer war of 1899-1902 the Boers were driven out from here by Gen. French. Pop. 2433, half of whom are whites.

Barbet (Lat. *barbatus*, bearded), a name applied to various birds of the families Capitonidæ and Bucconidæ, common to tropical Africa, Asia, and America, because of the prominent stiff bristles about the mouth which assist them to catch insects. They are bright-coloured, and somewhat resemble the cuckoo in shape. Those of the Capitonidæ and Bucconidæ are known popularly as *thick-heads* and *puff-birds* respectively.

Barbette (Fr. diminutive of *barbe*) is the name given to the earthen terrace inside the parapet of a rampart, which serves as a platform for cannon. This terrace has such an elevation that cannon can be fired over the parapet instead of through embrasures, thus giving a larger scope. When guns are thus mounted,

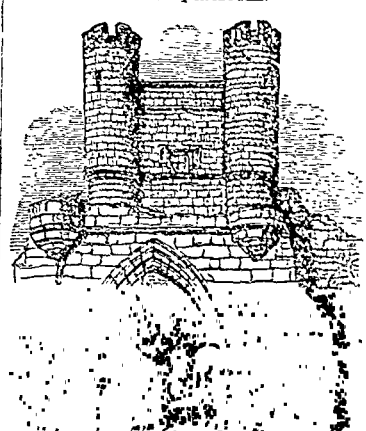
they are said to be mounted ' in barbette.' In the naval sense a B. is an armoured breastwork, fixed at no great height, behind which the heavy armament of a ship is mounted. The guns fire over the breastwork in the same way as over a B. on land, and are mounted on turntables, whilst the after-ends are protected by armoured hoods. Of late years the B. has superseded the other methods of firing heavy guns on board ship; the *Téméraire* in 1876 was the first British ironclad to be furnished with Bs.

Barbey d'Aurévilly, Jules Amédée (1808-89), Fr. author, was *b.* at Saint-Sauver-le-Vicomte in the dept. of Manche, France. In 1851 he went to Paris, where he helped to found *Le réveil*. Among his most brilliant novels are *Une vieille maîtresse*, 1851; *L'ensorcelée*, 1854; and *Un prêtre marié*, 1865. *See* E. Grelé's *J. B d' A.: sa vie et son œuvre*, etc., 1902.

Barbeyrac, Jean (1674-1729), a Fr. jurist, *b.* at Beziers, Lower Languedoc, of Calvinistic parents. He became teacher of the *belles-lettres* in the Fr. college at Berne, 1697-1711; appointed by the senate of Berne to the chair of law and history at the Academy of Lausanne, 1711; professor of law at the university of Groningen, 1717, where he died. He made his reputation on *Traité de Jeu* (first ed. 1709), which was enlarged in the posthumous Amsterdam ed. of 1737. His other works include a translation of Puffendorf's *Law of Nature and Nations*, 1712; a new version of Grotius' *De Jure Belli et Pacis* and *Histoire des Anciens Traités*.

Barbezieux, a tn. in the dept. of Charente, France, 19 m. S.W. of Angoulême. There are manufs. of linen and hats. Wheat, oats, and rye are grown in the neighbourhood; the vine is cultivated, and the capons of B. are held in great repute. It is the anct. tn. of Barbesillum, once surrounded by walls and defended by a strong castle. The castle was destroyed by the Eng. in the wars of Guienne, and rebuilt by Rochefoucault, but has since been almost entirely demolished. B. was the bp. of Elias Vinet, a 16th century antiquary and scholar. Pop. about 3000.

Barbican, or Barbacan, in ancient fortification, was usually a small round tower for the station of an advanced guard, placed just before the outward gate of the castle-yard, or ballium. In cities or tns. the B. was a watch-tower, placed at some important point of the circumvallation. It had sometimes a ditch and drawbridge of its own. The street of London called B. received its appellation from its vicinity to a tower of this sort attached to the city wall, the remains of which were visible within the last half-century. Spelman (*Glossary*) says B. was a term likewise used for a hole in the wall of a city or castle, through which arrows and darts were cast out. It also signified a long narrow opening left in the walls, to drain off the water from a terrace or platform.



BARBICAN

Barbier, Antoine Alexandre (1765-1825), a Fr. bibliographer, was born at Coulommiers. He was a member of the Council for the preservation of scientific and artistic objects of value. In this capacity he was instrumental in saving from destruction many collections of books, which had been hastily stored up after the suppression of various civil and ecclesiastical establishments, and placing them in public libraries. He was librarian to Napoleon, and administrator of the crown libraries until 1822.

Barbier, Henri Auguste (1805-82), a Fr. poet, was born at Paris. He was a voluminous writer, and his works include poems, poetic and dramatic criticisms and studies, impressions of travel, etc. The work by which he is best known is his *Iambic Verses*, a satirical poem in which he paints the life of his time in a rugged, forcible style. Amongst his other works may be mentioned *Lazarus*, dealing with the oppressed condition of the Eng. people, and *Pianto*, which is concerned with the misery of Italy. B. died at Nice.

Barbier, Paul Jules (1825-1901), a Fr. dramatic author, was *b.* in Paris. He was first known as a poet, and his first two pieces were played at the

Comédie Française. Later he wrote many dramas and comedies, often in collaboration with various other authors. His best work was, however, done as a librettist.

Barbieri, *see* GUERCINO.

Barbiton, the name of a musical instrument in use among the ancients. It was a kind of lyre.

Barbizon is a Fr. vil. near the forest of Fontainbleau, which gave its name to the 'Barbizon School' of artists. It was an outcome of the conflict between the classical and romantic schools of painting which occupied the first half of the 19th century. In 1824 the pictures of Constable confirmed the rising generation of artists in their resolve to abandon the pedantry of the old school. The B. school discarded the 'subject' idea, and took Nature herself as a guide. The struggle of the school to achieve recognition is the more remarkable, in view of the beauty of their pictures. The B. school, the distinctive note of which may be seen in the works of Millet and Rousseau, includes Corot, Millet, Rousseau, Daubigny, etc.

Barbou, the name of a family of Fr. printers, who long rendered themselves famous for the correctness as well as elegance of the works which issued from their presses.

Jean B. the first of the name who is known, was settled at Lyon, where he printed the works of Clement Marot, 1539. His descendants continued to exercise their art for more than two centuries. Two brothers of the family settled at Paris, Jean-Joseph B. in 1704, and Joseph B. in 1717. Joseph Gérard B., nephew of the two Bs. last mentioned, became a bookseller in 1746, took the printing office of his uncle Joseph's widow in 1750, and soon afterwards engaged in the series of classics which bears his name.

Barbour, Sir David Miller (*b.* 1841), British financier, became an Indian civil servant, and in 1887 was appointed financial member of Council of Governor-General of India. Since then he has been a member of various royal commissions on financial matters both at home and abroad, the latest appointment being that of member of the Royal Commission on Shipping Rings in 1907. In 1889 he was created K.C.S.I., and in 1899 K.C.M.G.

Barbour, or Barber, John (?1316-95), he took holy orders, and was promoted by King David II. to the archdeaconry of Aberdeen about the year 1356. He obtained permission from Edward III. to reside in Oxford for a time for the purpose of studying (1357), and similar permission to study and travel in England was granted in 1365 and 1368. In 1373 he was clerk of audit to the household of King Robert II. and in 1374 one of the auditors of the exchequer. His fame rests on *The Brus*, which he completed about 1376. It is an epic poem, written in octo-syllabic verse, recording the adventures of Robert the Bruce and his companion, Sir James of Douglas. It is written with great spirit; the style is clear and simple and the language more 'modern' than that of his contemporaries. The Edinburgh edition (1571) is the first printed copy extant. The best eds. are by Skeat, for the Early English Text Society (1870-7); and by Metcalfe for the Scottish Text Society, 1893-4; and *Barbour's Bruce*, ed. by W. M. Mackenzie, 1909. *The Siege of Troy* is a delightful fragment. *The Buik of Alexander* and the *Legends of the Saints* are not now generally held to be his. See *John Barbour, Poet and Translator*, 1900, by George Neilson.

Barbuda is an is. of the British W. Indies, situated in 17° 33′ N. and 61° 43′ W. It is 62 sq. m. in area, and is a dependency of Antigua, being formerly in possession of the Codrington family. It is densely wooded, and has a lagoon on the W. side. It exports phosphate of lime and salt, and breeds cattle and horses. Pop. about 1000.

Barby is a Ger. tn. in the prov. of Prussia, on the l. b. of the Elbe, 82 m. S.W. of Berlin. It has two churches and a seminary school, and there are sugar factories and breweries. Pop. 5500.

Barca, or **Barka**, a semi-independent Turkish vilayet, bounded on the N. by the Mediterranean, on the E. by Egypt, on the W. by the Gulf of Sidra, and on the S. by the Libyan Desert. The chief products are corn, rice, olives, dates, and saffron, and there is good pasturage. The most important oases are Aujila and Jalo. This region is the site of anct. Pentapolis (Five Towns), viz. Berenice (Benghazi), Arsinoë, Barco, Cyrene, and Apollonia. B. became a state in the time of Cyrus, but within a century became subject to Egypt. It was to the Romans one of their chief granaries along the African coast. It afterwards was declared a Gk. prov., but was conquered by the Arabs in 641. There are many traces of its early history—ruined temples, aqueducts, etc., are scattered about the country, and many Greek and Rom. coins have been discovered. The pop. estimated at 500,000, consists of Bedouin Arabs, Berbers, Turks, and a few Jews and Greeks. Area, about 70,000 sq. m. Capital, Benghazi.

Barcarolle, a kind of song in the Venetian language, sung by the gon-

doliers at Venice. These airs are often composed for the common people, and often by the gondoliers themselves. The airs are generally simple, but full of melody, and frequently have considerable refinement. Formerly most of the gondoliers knew by heart the greater portion of *Gerusalemme Liberata* of Tasso, and sang it in their gondolas in alternate stanzas. But Tasso is no longer sung by the gondoliers; they have still, however, their songs in response to each other. The old B. was sung in parts, at stem and stern of the same boat, by its own gondoliers. The well-known airs *La Biondina in Gondoletta* and *O Pescator dell'-Onde* are pleasing specimens of this species of song.

Barcellona, a tn. in Sicily, in the prov. of Messina. It is situated in a broad plain between the mts. and the sea. It abounds in corn, oil, wine, and fruit, and has sulphur baths. It forms one town with Pozzo di Gotto, the combined pop. being about 14,500.

Barcelona, the second largest and most important manufacturing city in Spain, and the principal seaport is situated on the Mediterranean Sea on a plain between the rivers Besos on the N. and Llobrégat on the S. The surrounding vegetation is almost of tropical luxuriance, contrasting strongly with the factories and busy docks. Formerly the city was surrounded by a strong line of ramparts, but these were pulled down in 1845 because they impeded the natural developments of the city. The ground which had been covered by the citadel was laid out in gardens. B. is divided into two parts, viz. the old town and the new. The former, with its narrow streets and general irregularity, forming a strange contrast to the wide streets and symmetry of the new tn. The main street of the old tn. is the Rambla, which has a fine avenue of plane-trees. The houses of the new tn. are chiefly in the modern Eng. style of architecture. The large suburb of Barceloneta lies to the E. Gracia, Las Corts de Sarria, and Horta are the chief suburbs. B. is the see of a bishop, and contains many ecclesiastical buildings. The cathedral, erected during the 13th and 15th centuries, is a fine example of Spanish Gothic architecture. It contains the tomb of Santa Eulalia, the patron saint of the city, and its stained-glass windows are among the finest in Spain. The university, founded in 1430, was suppressed in 1741, but restored in 1841. There are also many schools and colleges of art, science, and medicine, hospitals, charitable institutions, and sev. theatres. The prin. manufs. are silk, woollens, cottons, lace, hardware. Its fabrics are much inferior to Eng. wares. Chief imports are raw cottons, raw woollens, coffee, sugar, colonial produce, wheat, hides, iron, and coal. The number of ships annually entering and leaving the port is about 4000. The harbour was extended and its entrance improved in 1875. Steamers run to various ports in the Mediterranean. The pop. in 1900 was 533,000. It is the headquarters of Catalan art and literature. Area of prov. of B. is 2890 sq. m., and its pop. (1897) 1,034,538. Many interesting historical events are connected with B. It is said to have been rebuilt by Hamilcar Barca, father of the great Hannibal, about 233 B.C. It was held by the Romans, Goths, Moors, and Franks, and, with the prov. of which it is the cap., was made an independent country about A.D. 864, and incorporated with Aragon 1164, the last count becoming king. The city has suffered much by war and plague. The siege by the Fr. in 1694 was relieved by the approach of the Eng. fleet, commanded by Admiral Russell; but the city was taken by the Earl of Peterborough in 1706. It was bombarded and taken by the Duke of Berwick and the Fr. in 1714, and was taken by Napoleon in 1808 and retained until 1814. It revolted against the queen in 1841, and was bombarded and taken in Dec. 1842 by Espartero. Frequent insurrections have been raised here. An exhibition was opened by Alfonso XII. in March 1877. In the year 1879, B. was in a very prosperous state and has continued so up till the present time. In March 1882 there were violent riots on account of the French treaty, and Catalonia was in a state of siege. In 1856 a Progressist rebellion caused much bloodshed, and in 1874 the Federalists raised an insurrection here.

Barchamps, Charles Melchior Artus, Marquis de (1760-93), a celebrated Royalist leader in the revolt of La Vendée. He received his baptism of fire during the American War of Independence. On his return to France he was made a captain of the Fr. Grenadiers, and was in this service in the outbreak of the Revolution. Being a strong Royalist he returned to his château and remained in retirement until he was chosen a leader of the revolt in La Vendée. To his skill and judgment much of the success of the Vendeans was due. Dissensions broke out amongst the Vendeans, and finally, at the sanguinary encounter between revolutionists and royalists at Cholet in 1793, B. was mortally wounded. He died the next day, [illegible] his dying breath [illegible] prisoners whom [illegible] sworn to

massacre in revenge for his death should be spared.

Barckhausia, Barkhausia, or Crepis, is the name of a genus of Compositæ which has six species in Britain. *B. taraxacifolia* and *B. fœtida* have yellow flowers; the former grows in limestone dists. and the latter in chalky places. *B. setosa* is a native of Germany.

Barclay, Alexander (*c.* 1476-1552), poet, born probably in Scotland, travelled in Europe, became a monk at Ely and at Canterbury. His place in literature rests on *The Ship of Fools*, 1509, a translation or adaptation, in Chaucerian verse, of Sebastian Brandt's *Narrenschiff*, 1494, a satire of the social vices rather than the follies of the age. His other works are the *Eclogues*, 1513, an early pastoral in Eng.; *The Myrrour of Good Maners*, and a translation of Sallust's *Jugurtha*. *See* Jamieson, ed. of *The Ship of Fools*, 1874; Fairholt, ed. of 5th eclogue, *The Cytisen and Uplondyshman*; Fraustadt, *Uber Barclay's Ship of Fools*, etc., 1894.

Barclay, John (1582-1621), Scottish writer, born in France, son of William B. (*q.v.*). He came to London with his father and pub. a satire on the Jesuits, *Satyricon*, 4 parts, 1603-14. He subsequently was reconciled to Catholicism. He died in Rome. His popular political romance, *Argenis*, was pub. posthumously. *See* Dukas' *Satyricon* with Life, 1889; Boucher, 1879, and Dupont, 1875, for *Argenis*.

Barclay, John (1734-98), a Scottish divine, was educated at St. Andrews, and became assist. minister at Fettercairn, 1765. His opinions offended the Presbytery, which was supported by the General Assembly, and B. left the Church and founded the sect of the Bereans, so named after the people of Berea (Acts xvii. 11), who searched the Scriptures daily. *See* Memoir in collected works by Thomson and Macmillan, 1852.

Barclay, John (1758-1826), Scottish surgeon, nephew of the founder of the Bereans, born in Perthshire; studied medicine at St. Andrews and Edinburgh; M.D., 1776. In 1806 he was lecturer in anatomy to the College of Surgeons. He pub. valuable anatomical works, and was one of the pioneers of the movement for establishing surgical and pathological museums.

Barclay, Robert (1648-90), Quaker theologian, *b.* at Gordonstown, Morayshire. His father, Colonel David B. of Ury, had served under Gustavus Adolphus. Robert was educated at the Scots College, Paris. Joining the Quaker society with his father in 1666, he was a strong controversialist with opponents, and suffered persecution. His *Apology for the True Christian Divinity* (Lat. 1676, Eng. 1678) is still a standard work of Quaker doctrine. He travelled with Penn and Fox, and was made nominal governor of the Quaker settlement of East New Jersey by James II., 1682. He died at the family estate of Ury.

Barclay, William (1546-1608), jurist, father of the author of *Argenis*, studied law under Cujas at Bourges, and became professor of law at the university of Pont à Mousson. In 1605 he had a dispute with the Jesuits and went to England, but in 1604 was professor of law at Angers, where he died. His chief legal work is *De Regno et Regali Potestate*, 1600; his posthumous attack on the temporal power of the pope, *De Potestate Papæ*, was edited by his son, 1609, and was answered by Bellarmino's *De Potestate Summi Pontificis*, 1610.

Barclay-Allardice, Robert (1779-1854), pedestrian, generally known as 'Captain Barclay,' was a descendant of the Barclays of Ury. He served in the Walcheren Expedition. In his great walk he completed 1000 m. in 1000 successive hours, at Newmarket, 1809. His time varied from 14 min. 54 sec. at the start to 21 min. 4 sec. at the close.

Barclay de Tolly, Michael Andreas (1761-1818), Russian general, born in Livonia, of an old Scottish family settled there in 17th century; distinguished himself against the Turks (1788), the Swedes (1790), and in Poland (1794). He fought (1806) as major-general at Pollusk and at Eylau, where he lost an arm. In 1808-9 he commanded in Finland, and his daring march across the ice of the Gulf of Bothnia and capture of Umeo is famous. Minister of war (1810-13), he and Bagration commanded the two armies against Napoleon, 1812. He was superseded by Kutusov after his defeat at Smolensk and left the army. He resumed command at Dresden, Kulm, and Leipzig, and was made field-marshal, 1814, and Prince Bogdanovitch, 1815.

Bar-cochba, or Bar-kokba, *i.e.* 'son of a star' (Num. xxiv. 17), the name of one Simon or Simeon, leader of the last Jewish revolt from Rome (A.D. 132-135). Nothing is known of his origin; the Rabbi Aqiba recognised him as the Messiah. He was for a time extraordinarily successful, retaking Jerusalem. The Roms., under Julius Severus, captured Jerusalem (135), when B. was slain; the rebellion was ended with great slaughter at Bether. To later rabbinical writers he is known as Bar-coziba, 'son of deceit.'

Barcochebas, *see* BAR-COCHBA.

Bard, the name which the Celtic

peoples applied to their minstrels, mentioned by classical writers as early as 200 B.C. Like the 'sceops' of the Anglo-Saxons and the 'skalds' of the Scandinavians, they celebrated in song, to the accompaniment of the harp, national victories and the great deeds of men. They led armies to battle, and they sang before their prince or chieftain in the hall, when the cup was passed down the benches. They flourished in Wales during the 6th century, when Taliesin, Aneurin, and Llywarch lived. King Howel Dha is supposed to have defined their privileges as court Bs. in A.D. 940, and the laws of the order appear to have been regulated again by Gryffyth ap Conan about 1078. Eisteddfods were held at Caerwys, Aberfraw, and Mathraval, when the Bs. competed with each other in skill, and judges, appointed by Welsh princes, awarded suitable degrees and privileges. On the conquest of Wales (1284), Edward I. is supposed to have hanged the Bs., as promoters of sedition among the people, but the bard-ship was revived by later kings, and existed down to the time of Queen Elizabeth. The eisteddfods discontinued about this time, but they were revived about 1822. Many early legends and ballads and much of the Arthurian cycle were handed down for generations in song by means of these Welsh bards.

In Ireland the order was probably hereditary, and appears to have been divided into three classes: 1. The Filidha, who sang in the service of war and religion. 2. The Breitheamhaim, who promulgated the laws in a recitative chant. 3. The Seanachaidhe, who chronicled the family history of the patrons to whom they were attached. Besides these three orders, there were minor Bs., called after the instruments they played. The harp, said to have belonged to Brien Boiromh, who fell in the hour of victory against the Danes on the plain of Contarf, is preserved in the museum of Trinity College, Dublin. After the conquest of Ireland by Henry II., the number of Bs. declined, though many chiefs retained them to keep alive a national feeling by their songs and legends. Turlough O'Carolan (1670-1737) was the last Irish bard.

Less is known of the Scottish Bs., but it is supposed that their status was very similar to that of the Irish B. They existed in the Highlands down to the 17th century.

The name 'B.' has in modern times been applied to poets, *e.g.* to Shakespeare, the 'B. of Avon,' and to Burns, the 'Ayrshire B.'

See Stephens, *Literature of the Kymry*, 1873; Jones, *Relics of the Welsh Bards*, 1884; W. F. Skene, *Four Ancient Books of Wales*, 2 vols., 1868: Evans, *Specimens of the Ancient Welsh Poetry*, 1764; *Myvyrian Archaiology of Wales*, ed. Jones, Williams, and Owen new ed., 1862; Walker, *Memoirs of the Irish Bards*, 1786; Douglas Hyde, *A Literary History of Ireland*, 1899; D. D. Evans, *Ancient Bards of Britain*, 1906.

Bard, or Bardo, is a vil. in Italy, situated on the Dora Baltea, about 20 m. S.E. by S. from Aosta by rail. It has a strong fortress. Pop. 500.

Bardesanes (154 – 222 A.D.) (Bar Daisan, son of Daisan, a river), called the 'last of the Gnostics.' A Syrian theologian, born at Edessa. For some time he lived at the court of Abgars, but when Edessa was taken by Caracalla (217), he fled into Armenia. It was largely through the influence of B. that Christianity was first introduced into Edessa. He wrote 150 hymns, in which he expressed his doctrines, and which had a far-reaching influence. B. was accused of polytheism, a charge which he denied, and Eusebius speaks of him as having been a Valentinian Gnostic. He upheld that evil was the revolt of matter upon spirit, and yet he maintained that the devil was an independent, existing spirit. He denied the doctrine of the resurrection of the body, and preached that Christ's body was not living flesh, but an illusory likeness sent by God. The book of *Laws of Countries*—Cureton, *Spicilegium Syriacum*. London, 1855, and the *Ante-Nicene Fathers*, New York, 1895—has been ascribed to B., but is probably the work of a disciple. For early references, consult Harnack, *Geschichte der Altchristlichen Litteratur*, vol. i., Leipzig, 1893, and for monographs, Merx, 1863; Hilgenfeld, 1864.

Bardi, a tn. in the prov. of Piacenza, Italy, 31 m. S.W. of Parma. Pop. (commune) *7000*.

Bardili, Christoph Gottfried (1761-1808), Ger. philosopher, was born at Blaubeuren in Würtemberg. He became a professor of philosophy at Stuttgart, and as an expounder of rational realism he anticipated such thinkers as Hegel and Schelling. His chief work, in which he criticised Kant, is the *Grundriss der Erster Logik*, 1800.

Bardowiek, a tn. in the prov. of Hanover, Prussia, 4 m. N. of Lüneburg, on the Ilmenau R. It was formerly an important commercial centre, but in 1189 Henry the Lion, Duke of Saxony, destroyed the town There are ruins of a cathedral, and a 14th century Gothic church. Pop. (1900) 2002.

Bardsey, a small is. off Carnarvon-

shire, N. Wales, about 2 m. long by 1 m. broad. It is only accessible on the S.E. side, where there is a small well-sheltered harbour. There is a hazardous trade in taking eggs from the sea-cliffs. The soil is fertile, and produces barley and wheat. B. (or Bards' Ey, the Isle of Bards) is, according to legend, the last retreat of the Welsh bards. There was formerly an abbey of some celebrity on it, which was suppressed by Henry VIII. Numerous graves lined with stone, a large building, said to have been the abbot's lodge, and a ruined chapel or oratory are the only remains. Pop. about 120.

Bardstown, or **Bairdstown**, the co. seat of Nelson co., Kentucky, near the Beech Fork of Salt R., and on the Louisville and Nashville Railroad; 39 m. S.E., by rail, of Louisville. It has sev. educational institutions, besides various manufs., distilleries, saw-mills, and a wagon factory. There is trade in cattle, hogs, grain, and whisky. Pop. (1900) 1711.

Bardwan, or **Burdwan**, the cap. of the dist. B., Bengal, British India, 67 m. from Calcutta. It contains the palace and gardens of the Maharajah of B. and numerous temples, but the rest of the buildings are squalid. It is a collection of seventy-three vils. and suburbs. Pop. (1901)35,022. The dist. has an area of 2697 sq. m., and a pop. of 1,534,100. There are coal mines at Raniganj. The principal exports are silk, jute, tobacco, rice, and iron and coal.

Barebones Parliament, the name of the 'Little Parliament' (July 4-Dec. 12, 1653), summoned by Cromwell after his violent dissolution of the 'rump' of the Long Parliament. It consisted of 140 selected nominees of the congregations in each county. Its unruliness and incapacity led to its dissolution at the request of the moderates. The name, given to it by its opponents, is due to the member for London, Praise God Barbon or B. (1596-1679), a rich leather-seller and fifth monarchy man. He does not seem to have taken any prominent part in the parliament. He was imprisoned, 1661-2, for his opposition to the restoration.

Barège, a gauze-like fabric for summer wear, used for women's dresses. It is a mixture of silk and worsted, or cotton and worsted, and is generally produced in light colours. The best quality is manuf. in France, where it is called *crêpe-de-barège*, from the tn. Barèges, where it was first made. At the present time it is chiefly produced at Bagnères de Bigorre.

Barèges, a watering-place with warm sulphur springs, Hautes-Pyrénées, France. It is 4040 ft. high, and only visited in summer. The mixed silk and wool fabric, barège, is now made at Bagnères de Bigorre, 25 m. S.W.

Bareilly, a tn. and dist., B. or Rohilkhaud div. of the United Provs., British India, area of dist. 1580 sq. m.; pop. 1,090,117: of tn. 131,208. This dist. is highly cultivated, and is irrigated by the Rohilkhand canal system. There is an important native college in the town.

Bareith, *see* BAIREUTH.

Barents, Willem (*d.* 1597), Dutch explorer. His first expedition, 1594, in search of a N.E. passage to Asia, surveyed the W. coast of Nova Zembla to the Great Tee Cape; the second, 1595, failed; he was chief pilot to the last journey, 1596. He discovered and named Spitzbergen and Bear Is., rounded Nova Zembla, and was the first to winter in the ice. On the return in open boats he died The hut where they wintered was found in 1871, and B.'s jour. in 1875. B. Sea and Is. are named after him. *See* Hakluyt Soc. trans. of De Veer's *Three Voyages of Barents*, 1876.

Barents Island, an is. in the E. of the Spitzbergen Archipelago, named after William Barents, the 16th-century Dutch explorer.

Barents Sea, that part of the Arctic Ocean which lies between the European mainland, Nova Zembla, Franz-Josef Land, and Spitzbergen. Its average depth is 100 fathoms. The part near the Kola coast is called the Murman Sea. Consult Nansen, *The Norwegian North Polar Expedition*, vol. iii., 1902.

Barère de Vieuzac, Bertrand (1755-1841), Fr. revolutionist, *b.* at Tarbes: was elected as deputy for Bigorrs to the states-general, 1789, and reported the debates in his paper, the *Point du Jour*. He joined the republican party after the flight to Varennes. As deputy for Hautes-Pyrénées to the National Convention, 1792, he first was a Girondist, but later one of the Mountain, and voted for the death of the king. He closed his speech with the phrase, 'the tree of liberty does not grow if it be not watered with the blood of kings.' He was member of the first and second Committee of Public Safety, 1793, supporting Robespierre, but withdrawing at his fall. He was imprisoned after the terror, but escaped. He was employed by Napoleon, turned Royalist in 1814, but was exiled as a regicide in 1815. He was the last survivor of the Committee of Public Safety. *See* Aulard, *Les Orateurs de la Convention*, 1905.

Baretti, Joseph (1719-89), It. writer, born at Turin; he came to London in

1751 as a teacher of Italian; he became secretary to the Royal Academy, and pub. the *Italian Library*, 1757. His jour., *Frusta Letteraria* (the 'Library Scourge'), Venice, 1763-5, was marked by bitter but independent criticism. He was well known to Johnson and his circle, and often figures in Boswell's *Life*. He was tried on the capital charge of killing a man who assaulted him in London, 1769; the evidence of Johnson, Burke, and Garrick as to his character served to secure his acquittal. His *Dictionary and Grammar of the Italian Language* and *Lettere Famigliari*, trans. 1770, were well received.

Barfleur, seaport tn. in the dept. of La Manche, France, 15 m. from Cherbourg. It was an important harbour for the Channel passage to England in the Middle Ages. The *White Ship* sank off the port with Henry I.'s only son William. Off Cape B. was fought the first of the series of naval battles between Tourville and Russell, May 1692, known in Eng. history as the battle of La Hogue (*q.v.*). The Cape Barfleur lighthouse is 233 feet high.

Barfod, Paul Frederic (?1818-96), a Danish historian who favoured the union of Norway, Sweden, and Denmark. Of his works the chief are: *A History of Denmark and Norway under Frederic III.* (1873) and *A History of Denmark*, 1319.

Barfrush, *see* BALFRUSH.

Barga, a tn. in the prov. of Lucca, Italy; manufs. paper. Pop. 8500.

Barga Pass, a pass of the Himalayas in the N. of the Rajput hill state of Bashahr, or Bisaher, Punjab, India.

Bargagli, Scipione, was *b.* at Siena, in Tuscany, of a patrician family, about the middle of the 16th century. He became distinguished as an elegant writer. B.'s prin. works are: *I Trattenimenti*, 4to, Venice, 1587, which by some is called B.'s novels; *Dell' Imprese*, 4to, Venice, 1594, a work of considerable erudition concerning the origin and symbolic language of devices and mottoes in the ages of chivalry; *Il Turamino, ovvero del Parlare e dello Scriver Sanese*, 4to, Siena, 1602, a dialogue on the various dialects of Tuscany, but especially that of Siena. B. wrote other minor works both in prose and verse. He died in 1612.

His brother, Girolamo, who was a professor of law in his native city, wrote a book called *Dialogo dei Giuochi che nelle Vegghie Sanesi si usano di fare*, 8vo, Venice, 1575, which is an explanation of the numerous *social games* which used to be and are still occasionally played in Italy among friendly parties assembled to pass together the winter evenings.

Bargain and Sale, in law, a form of conveyance of real property now obsolete. It was one of the means by which an owner could avoid the feudal restrictions on the disposition of land. 'Livery of seisin,' *i.e.* actual open delivery of land alone gave the legal title. If A bargained to sell land to B, and B gave even nominal consideration, the courts gave B the equitable, *i.e.* beneficial ownership. The Statute of Uses, 1535, transferred the legal title to the bargainee, thus allowing an easy method of secret conveyance. To prevent this, by the Statute of Enrolments, 1835, all such conveyances were to be by deed publicly enrolled. This was also evaded by conveyance by 'lease and release.' The Real Property Act, 1845, did away with the necessity of both these forms.

Bargé, a tn., prov. of Cuneo, Piedmont, Italy, S.W. of Turin. Pop. 2074. There are slate quarries in the neighbourhood.

Barge, a term generally applied to large flat-bottomed boats used for the carriage of heavy goods on canals or rivers; for this purpose they are usually towed; when employed for the transhipment of cargo from larger vessels to shore, or *vice versâ*, they are termed 'lighters;' 'dumb-barges' are steered with an oar and drift with the tide. The barges of the Great Lakes and E. coast of N. America run to great size, carrying over 3000 tons of cargo. The 'state barge' is an ornamented vessel with a compartment for passengers in the stern, and is rowed by a crew of ten to more oars. In former days the Lord Mayor's procession was rowed on the Thames in his state-barge with those of the different livery companies. The royal state barge, manned by the king's watermen was seen at Henley Regatta in 1912. The modern 'house boat' [illegible]
but
bank
at O:
the college rowing clubs.

Barge-board, formerly often called 'berge-board,' the board attached to the projecting roof of a gable, covering the rafters and protecting them from weather. When elaborately carved, as in the *14th and 15th centuries*, they form an ornamental feature of the roof. Original Bs. of this date are sometimes to be seen on the gables of porches of churches and on lych gates.

Barge Course, a term applied to that part of the tiling of a roof which projects over the gable end of a building; the under part of which is stuccoed. To protect this stucco from the weather, two boards, called barge-boards, following the inclination of

the roof, are often attached to the gables of old Eng. houses, fixed near the extremity of the B. C., and carved in the Gothic style.

Barh, a tn. in Bengal, British India, in the dist. of Patna, on the r. b. of the Ganges, 31 m. from Patna. Pop. 12,400.

Barham, First Baron, *see* MIDDLETON, SIR CHARLES.

Barham, Francis Foster (1808-71), was the son of Thomas Foster B. (1766-1844), and the founder of the religion called 'Alism.' He edited Jeremy Collier's *Ecclesiastical History of Great Britain*, 1840, and pub. a revised version of the Bible, 1848.

Barham, Richard Harris (1788-1845), Eng. writer, born at Canterbury; inherited Tappington Everard in Kent; was educated at St. Paul's and Brasenose College, Oxford. He was ordained 1813; minor canon of St. Paul's, 1821; a priest in ordinary to the Chapels Royal with a city living, 1824. In 1837 he contributed to Bentley's *Miscellany* the first of [illegible] in verse, *In-* [illegible] the pseudonym by.' The first collected series were pub. in 1840, second, 1842, and third, 1847, with a Memoir. Their high spirits, amazing rhymes, and inexhaustible humours fully account for their lasting popularity. See *Life and Letters* by his son, R. H. D. B., 1870.

Bar Harbour, Hancock co. on the E. side of a fashionable summer resort. Mt. Desert, an is. off the coast of Maine, U.S.A. Steamers pass regularly to New York, Portland, and Boston. Pop. about 2000.

Bar-Hebræus, *see* ABULFARAGIUS.

Barhiya, a tn. in Bihar, India; pop. 15,000.

Bari, dist. in the N.E. of Uganda, on the White Nile, N. of Albert Nyanza. Its centre is Gondokoro. The B. tribe of Nilotic negroes are a pastoral people of the White Nile, S. of the Dinka and W. of the Galla tribes.

Bari, chief tn. of the prov. of B., Apulia, Italy, on the Adriatic, 69 m. N.W. of Brindisi. Pop. (1901) 77,478. It is the seat of an archbishopric and of the 9th Army Corps. Its trade and industries, olive oil, soap, iron and steel, and chemicals make it the most important centre of Apulia. In the old tn. are the cathedral, S. Sabino, 1035-1171, the churches of S. Nicola of Myra, 1087, and S. Giorgio, 11th century. The Norman castle is used as a prison. The anct. Barium was a harbour in Rom. times. Captured by the Saracens, 812, it fell to the Byzantine empire, 885. It was taken by the Normans under Robert Guiscard, 1071. It was an independent duchy in the 14th century, and was annexed to Naples, 1558.

Bariatinski, Alexander Ivanovitch, Prince (1814-79), Russian general, served with great distinction in the Caucasus, 1835 and 1845, and after successful campaigns, 1848-56, was made commander-in-chief and governor-general. Within three years he broke the back of Shamyl's resistance, taking his stronghold and finally the leader himself at Gunib, Darghestan, 1859. He was made field-marshal, 1859, but, broken in health, retired, and died in Geneva.

Bari Doab, a plain situated between the Rs. Ravi and Bias in the Punjab, India. There is in this dist. a canal called the B. D. Canal, which receives its water from the Ravi.

Barili, a tn. W. coast of Cebu prov., Philippine Is. It is a fertile, wooded dist., and trades in woven fabrics (silk, cloth, etc.). Has also important fisheries. Pop. with dist. round (1903) 31,500.

Barilla, the Spanish name of an impure carbonate of soda imported into Britain from Spain, the Canary Islands, Sicily, Italy, and France. It is obtained from the ashes of plants, especially *Salsola soda*, and is used in the manufacture of glass and soap.

Baring, the name of a family of Eng. bankers and financiers, several members of which have been distinguished as statesmen and administrators. There are four peerages in the family, the earldoms of Northbrook and Cromer, the baronies of Ashburton and Revelstoke. John B. came from Bremen, in Germany, and started a cloth factory near Exeter. His son Francis (1740-1810) founded the banking house of B. Brothers in 1770, was director and chairman (1792) of the E. India Co., supported Pitt in parliament (1784-1806), and was made a baronet, 1793. At his death the firm was the first banking house in Europe. His eldest son, Sir Thomas (1772-1848), was a great art collector, and the firm was managed by his second son, Alexander (1794-1848), who extended its influence in America, was president of the Board of Trade, 1834, and made Baron Ashburton, 1835. He settled the Canadian-Marine boundary question, 1842. At his death the management of the firm passed to Thomas (1799-1873), second son of Sir Thomas, and on his death to Edward (1828-97), son of Henry, third son of the founder of the firm, who was created Baron Revelstoke, 1885. It was during this period that the continued default of the Argentine gov. involved the firm in such difficulties that a most serious financial crisis ensued (1890), only relieved by the action of

the Bank of England and the prin. London joint stock banks, in taking over the enormous liabilities of the firm. B. Brothers was reorganised as a limited company. Sir Thomas B.'s eldest son, Sir Francis (1796-1866), was Chancellor of the Exchequer (1839-44), First Lord of the Admiralty (1849-52), and created Baron Northbrook, 1866; his son Thomas (1826-1904) was made Earl Northbrook, 1876, was Viceroy of India (1872-76), and First Lord of the Admiralty (1880-85). The youngest son of Henry B., a brother of the first Lord Revelstoke, is Evelyn B. (1891), first Earl Cromer (*q.v.*).

Baring-Gould, Sabine, Eng. author, born at Exeter, 1834; educated Clare College, Cambridge; was ordained and became rector of E. Mersea, Essex, 1871, and of Lew Trenchard, Devon, 1881. From 1854 onwards he has written many books of folklore, mythology, ancient manners and customs, and of travel, such as the *Book of Were Wolves*, 1865; *Curious Myths of the Middle Ages*, 1866; *Germany* (Story of the Nations Series), 1886; *Curious Survivals*, 1892; *Cave Castles of Europe*, 1911. His theological works include *The Lives of the Saints*, 15 vols., 1872-77. His *Life of Richard Hawker of Morwenstow*, 1875, new ed. 1886, was much criticised. His *Songs and Ballads of the West*, 1890, contain a valuable collection of folksongs. Of his long series of novels the best known are: *Mehalah*, 1880; *John Herring*, 1882; *Court Royal*, 1886; *Red Spider*, 1887. He is also the author of the following hymns: 'Onward Christian soldiers;' 'Now the day is over;' and 'Through the night of doubt and sorrow' (translated from Danish).

Baringo, Lake, in British E. Africa, about 30 m. N. of the equator. Its elevation is 3325 ft. and length about 16 m. Its position was not accurately known till 1883, when it was first seen by Joseph Thomson.

Baris, a genus of coleopterous insects, belongs to the family Curculionidæ, or weevils. It feeds upon dead parts of trees, and is consequently not injurious in any way. *B. lignarius* feeds upon the elm-tree both in the larva state and that of the perfect insect. The little weevil selects a hollow tree, enters the dead wood hinder part first, lays its eggs, then dies, and its body thus blocks up the entrance and protects the young.

Barisal, a tn. Bakarganj dist., Eastern Bengal and Assam, British India, on B. Riv. It has a large riv. trade. The 'B. guns,' strange sounds, like the report of canon or thunder, heard off the mouth of the riv., have not yet been explained. Pop. (1901) 18,978.

Barito, a river of Dutch Borneo, which flows southwards into the Java Sea, after a course of 550 m. It is navigable for some distance up; at high tide the bar at the mouth has over twelve feet of water. An arm of the B. flows S.W. and joins the Kapuas; from the junction a canal runs to the main stream.

Baritone, *i.e.* 'deep-sounding' (Gk. *βαρύς*, heavy, *τόνος*, tone), the name of that range of the adult male voice which lies between a tenor and a bass. It is to be regarded as a high bass rather than a low tenor; compass from the lower A on bass stave to F above the stave.

Barium, a metallic element belonging to the group of alkaline earths. In 1602 Casciorolus, a Bolognese shoemaker, investigated the properties of heavy-spar, and noticed that it became phosphorescent in contact with ignited combustible matter. In 1774 Scheele discovered in a sample of black oxide of manganese a new earth which was afterwards identified with a constituent of heavy-spar. This earth was called baryta (Gk. *βαρύς*, heavy), and was shown to be an oxide of a metal by Davy. He succeeded in producing an amalgam of the metallic B. with mercury, but no satisfactory isolation of the metal was accomplished until Guntz, in 1901, obtained an amalgam by electrolysing a saturated solution of B. chloride; the amalgam was heated in the electric arc to about 1000° C., and the B. obtained in the form of a soft, silver-white metal. The monoxide BaO is obtained by heating the carbonate or nitrate; further heating transforms the monoxide into the dioxide BaO_2. At a still higher temp. the additional oxygen is set free, so that by alternately lowering and raising the temp. oxygen may be absorbed and collected from the atmosphere. In Brin's oxygen process the pressure is varied instead of the temp. B. hydroxide is a white soluble powder; the solution is known as baryta-water and readily absorbs carbon dioxide from the air. B. chloride is obtained by the action of hydrochloric acid on witherite; it is used in the preparation of the artif[illegible] is used as a *pign* [illegible] *blanc fixe*, or ' [illegible] e impurities in t[illegible] upon it. B. nitrate is a powerful oxidising agent, and like the chlorate is used for the production of 'green fire' in pyrotechny. B. may be detected by the apple-green colour imparted to the Bunsen flame by the metal and its salts, and by the immediate precipitation of the salts by a solution of calcium sulphate. B. salts are very poisonous, causing death by paralys-

ing the heart. In small doses they strengthen the muscular power of the heart, but are seldom employed. The old sulphur well at Harrogate and the waters at Llangammarch are said to contain about six grains of B. chloride per gallon.

Bar-Jesus, *see* ELYMAS.

Barjols, chief tn. in the canton of Var. Its chief exports are figs, raisins, and olives. The whisky distilleries are important. Pop. 2500.

Bark consists of dried-up tissues, which often belong to different tissue-systems, lying outside the active cork-cambium of stems. The first phellogen nearly always dies, and a second phellogen produces a cork-layer which naturally cuts off the supply of water to the outside layers, and consequently aids in the formation of the B. It may be either *scaly* or *ringed:* in the first case only isolated patches of tissue have become B. and as the trunk of the tree increases in size the B. becomes torn in scales; in the second case concentric rings are formed and the B. forms a complete ring. Examples of the former are the pine, plane, and larch, of the latter, vine, clematis, birch, and honeysuckle.

Bark, Peruvian, is obtained from sev. species of Cinchona, a genus of Rubiaceæ, and is of much value in medicine as the producer of such drugs as quinine and cinchonidine. It is known by many other names, such as Jesuits' bark, China bark, quina, quinquina, and cinchona bark. *See* CINCHONA.

Bark, Uses of, are many and various. In savage lands canoes, shields, baskets, and clothing are made of it. In tanning it is a most valuable object, and the *Quercus suber*, an oak of S. Europe and N. Africa, produces an outer covering which is rich in tannic acid. Sev. other varieties of oak, such as *Q. robur* and *Q. tinctoria*, are also much used, while *Acacia decurrens* and *Abies Canadensis*, or hemlock spruce, are other plants containing tannin. The bast fibres are employed in commerce, examples of which are flax, jute, and hemp. Medicinally B. is frequently noteworthy, the best-known being Cinchona, otherwise Jesuits', or Peruvian B.; other kinds are angostura, cascara, cascarilla, and witch hazel. Cinnamon is obtained from B., the wild cherry is valued in cough-mixtures, pomegranate B., or granatum, is used to expel tapeworms. Resins, gums, and balsams may be produced by various barks.

Barka, *see* BARCA.

Barka, or Bengazi, the anct. Cyrenaica, is a Turkish vilayet on the Mediterranean, between Tripoli and the Gulf of Sidra. Its western boundary is Egypt, and on the E. it extends to the desert of Libya. It is mainly a desert plateau, though the fertile strip along the coast has some fine pasturage, and produces corn. The northern and western slopes are covered with forests of pine-trees; dates and olive-trees grow, and flowering shrubs are found. The region was in old times the seat of the Pentapolis, or five Gk. cities: Berenice, Arsinoe, Barca, Appollonia, and Cyrene. B. is the only one of these of any consequence which now remains. The area of the vilayet is 60,000 sq. m., and pop. about 600,000.

Barkal, or Jebel Barkal, is a flat-topped, isolated rock, which rises precipitously from the desert on the r. b. of the Nile, some little distance above the vil. that is now called Merawi. It was in anct. times considered as a holy mt. by the Egyptians. Its chief interest in modern times is in the excavations and researches which have been carried on in the neighbourhood. Many pyramids, varying in height from 35 to 60 ft., and six temples are found.

Bark-bed, a term used in horticulture for a bed made of waste bark from tanneries. When placed in the brick pit of a forcing-house the bark ferments, and the warmth and moisture thus produced assist in the development of the tender plants.

Bark-beetles are coleopterous insects of the family Bostrichidæ, but the name is often given loosely to beetles of other families. They do much damage, as they live on the bark of forest-trees. *See* E. A. Ormerod's *Manuel of Injurious Insects*, 1890.

Barker, Benjamin (1776–1838), landscape painter, brother of the more distinguished brother Thomas B. (*q.v.*). Exhibited at the Royal Academy between 1800 and 1821. He pub. a set of forty-eight views engraved by Theodore Fielding.

Barker, Edmund Henry (1788-1839), classical scholar, born in Yorkshire; educated at Trinity College, Cambridge. He assisted Samuel Parr at Halton and went to Thetford. His chief work was the revision of Stephanus' *Thesaurus Græcæ Linguæ*, 1816-28, severely criticised by Bloomfield. He died in great poverty.

Barker, Robert (1730-1806), artist, born in Ireland; settled in Edinburgh as a portrait painter. In 1788 he produced the first panorama, that of Edinburgh, following a suggestion of a German architectural decorator, Breisig. He subsequently produced popular panoramas of London, and of naval battles of the time.

Barker, Thomas (1769–1847), an

Eng. landscape painter, was *b.* in a vil. near Pontypool, Monmouthshire. He was allowed facilities for copying the works of some Dutch and Flemish masters by a rich coach-builder of Bath named Spackman, who sent him to Rome for four years in 1790. He returned to England after this and settled at Bath. Few pictures of the Eng. school have been more widely known than 'The Woodman,' which was engraved by Bartolozzi. His pictures as a rule were widely popular, being engraved on china, linen, and pottery. His best work was the large fresco which he executed in his house at Sion Hill, Bath, representing the 'Inroad of the Turks upon Scio in April 1822.' He exhibited at the British Institution and the Royal Academy. He was entirely self-taught in his art. He died at Bath on December 11, 1847.

Barker Thomas Jones, Eng. painter, son of Thomas B., was born at Bath in 1815. After being given some education in art by his father, he went to Paris in 1834, and was a pupil of Horace Vernet for several years. He exhibited frequently at the Salon, his first picture there, 'Beauties of the Court of Charles II.,' gaining him a gold medal. He subsequently received two other gold medals, and over twenty of silver or bronze, and in 1840 he was awarded the Cross of the Legion of Honour for painting 'The Bride of Death' for the youngest daughter of Louis-Philippe. In 1845 he went to England, and painted the portraits of sev. eminent men, Disraeli amongst them. He exhibited at the Royal Academy, and in 1870 went to the Franco-German war, whence he obtained many subjects for pictures. He has been called 'the Eng. Horace Vernet.' He died at London on March 27, 1882.

Barking, a tn. Essex, England. It lies on the R. Roding, 8 m. from Liverpool Street Station, London. It is a suffragan bishopric to St. Albans. Of the great nunnery only a gateway remains. All Hallows, B., near the Tower of London, belonged to it. The church of St. Margaret has some interesting monuments. At B. Creek is the outfall of the N. London sewer. Pop. (1901) 21,547.

Barkly, Sir Henry (1815-98), Scotch colonial administrator, educated at Bruce Castle School, Tottenham. In 1845-9 he was M.P. for Leominster as a 'firm supporter of Peel's commercial policy,' 1849 governor of British Guiana. Advocated introduction of coolies and Chinese as labourers, developed colony by introducing railways. 1853-6 governor of Jamaica; 1856 of Victoria; 1863 of Mauritius; 1870-6 of the Cape. K.C.B., 1853; G.C.M.G., 1874. *See* Theal's *History of South Africa*.

Barkly East, a tn. in Cape Colony, S. Africa, situated 58 m. E.S.E. of Aliwal North. It is the cap. of a dist. of the same name, and stands at an elevation of 583 ft. Pop. (1891), 876.

Barkly West, a tn. in the northern div. of Griqualand West, Cape Colony, 25 m. as the crowflies from Kimberley, with which communication is maintained by cart. It is the cap. of the dist. of the same name, and possesses diamond mines, in which the 'river stones,' of great value, are found. It is situated at an elevation of 3800 ft. Pop. (1891), 1034.

Barkul, a tn. of Dzungaria, in Central Asia, to the N. of the Gobi Desert, in lat. 43° 40′ N. and long. 94° E. Near to it is Lake B., which is situated 5100 ft. above sea-level.

Barkway, an anct. vil. of Hertfordshire, about 4 m. S.S.E. from Royston, in the N.E. of the Hitchin div. At the time of the Conquest the lands were divided among four great lords into as many manors, and afterwards into eight manors. It was privileged by Edward I. to have a market on Thursday, but this has been discontinued. Pop. about 1000.

Barlaam and Josaphat, a Christian religious romance very popular in the Middle Ages, and trans. into every European language. The Gk. original is attributed to John of Damascus (*fl.* early 8th century), but modern writers have traced an earlier Syrian source. The story of the Indian prince Josaphat, and his withdrawal to the wilderness and a life of asceticism through the teaching of the hermit B., is a strange Christian version of the life of the Buddha. The name 'Josaphat' is a perversion of 'Bodisat,' and passages seem verbally taken from Sanskrit texts. The identity of the two stories was noticed in the 16th century, but first stated by Labonlaye, 1859, and proved by Liebrecht, 1860. Further the lost 'Apology of Aristides,' a 2nd century defence of Christianity, has been found embedied in the story. Both B. and J. were canonised in the Eastern and Roman Church. *See* J. Jacobs, *Barlaam and Josaphat*, 1896.

Barlæus, or **Caspar van Bærle** (1584-1648), born at Antwerp. Studied theology at Leyden; took orders; professor of logic at Leyden, 1617; dismissed from his office, 1619, for siding with the Arminians against the Gomarists. Professor of philosophy at Amsterdam, 1631. He wrote: (1) poems, chiefly in Lat., some in Dutch, which are the best; (2) an interesting history of Brazil, which was then possessed partly by the Dutch. One of his Lat. poems had for its subject

the accession of Charles I. His letters were published at Amsterdam, 1667.

Bar-le-Duc, or **Bar-sur-Ornain**, cap. of the Fr. dept. of Meuse, on the R. Ornain, and on the Marne-Rhine canal, 158 m. E. of Paris. It manufs. cotton, calico, and hosiery; preserves are made, and there is trade in timber, iron, wool, and wine. The church of St. Pierre dates from the 14th century, and contains the tomb of William of Orange. A ruined castle, the ancestral home of the Dukes of Bar, overlooks the entrance into Lorraine. The Old Pretender, Chevalier de St. George, lived here for three years. It was the bp. of the Duke of Guise (1519-63), and Marshal Oudinot (1767-1847). Pop. (1901) 15,306.

Barleria, a genus of Acanthaceæ found in the East Indies. A few species grow in Eng. gardens and hothouses, and of these *B. [illegible]*, with its large bracts resembl[illegible]g hops, and *B. prionitis*, a common swamp-plant in Java, are the most remarkable.

Barletta, a tn. prov. of Bari, Apulia, Italy. The fine harbour makes it an important seaport for the exports of wine, sulphur, and oil of the district Before the cathedral, S. Sœpolero (12th century), is a fine antique bronze statue of Honorius. Pop. (1901) 42,022.

Barley, or *Hordeum*, is an extensively-grown cereal of very ancient culture, which belongs to the order Gramineæ. There are four unimportant species of barley-grass in Britain, of which *H. pratense* and *H. murinum* are two. *H. vulgare* is the cultivated species, growing as far N. as 70 degrees; it is the Scottish *bere* or *bigg*, and has its grains in four rows; *H. distichum* is a two-rowed and *H. hexastichum* a six-rowed variety. *H. cœleste*, the Siberian B., a variety with naked seeds, is cultivated in some parts of Europe, but the grain shakes off so easily as to render a bad harvest very frequently.

Formerly B. was considered to be of great value as a food in England, but now it is most often converted into malt for brewing and distilling. Ground down into barley-meal it is used for bread-making in N. Europe, and is a food for cattle; it is also made into decoctions for invalids, especially those who have pulmonary complaints, and is extremely soothing in fevers. The varieties known as pot-barley and pearl-barley are very nutritious and wholesome, and it is to bc [illegible] us[illegible] la[illegible] in[illegible] su[illegible] is obtained by depriving the grain of its outer husk, the latter by rounding it and polishing it in the mill after the removal of the husk. In Scotland a peculiar dish, called *sowens*, is made of the bran, which is steeped in water and allowed to ferment for sev. days until it becomes acid.

B. grows best in a warm, dry climate; the soil should be richly manured, and the practice of sowing clover, rye grass, or other seeds with it is considered to improve it greatly.

Barley-break, an old Eng. country game which was popular in the 16th and 17th centuries, referred to by Herrick, Sidney, Suckling, and Massinger, and still surviving with modifications in the N. of England and Scotland. It was played by six couples, three of each sex, placed in three adjoining plots of ground, the central one being called *hell*. The middle couple, always united, had to attempt to catch the other couples as they changed places, these latter being allowed to *break*. The name may have come from the stack-yard in which it was played.

Barley Midge, a dipterous insect of the family Cecidomyiidæ, allied to the Hessian fly, or *Cecidomia destructor*. It obtains its name from its destruction of B., while the latter is a spoiler of wheat.

Barley-sugar, a confection made with a syrup prepared from sugar. hardened in moulds and generally twisted into spiral sticks. Originally the sugar was boiled in a decoction of barley.

Barlow, Francis (1626-1702), animal painter and engraver. He etched some of the plates of his own illustrations to a translation of Æsop's fables. There is also a book of birds by B., engraved by W. Fairthorn.

Barlow, Henry Clerk (1806-76), English commentator and writer on Dante, born at Newington Butts, died at Salzburg. Apart from many separate papers published on various special subjects connected with the poet, his prin. work is *Critical, Historical, and Philosophical Contributions to the Study of the 'Divina Commedia.'* He bequeathed his Dante Library to the Library of University College, London.

Barlow, Jane (*b.* 1860), authoress of sketches, novels, and tales of Irish life and character, was born at Clontarf, Dublin. Her father, the Rev. W. B., was formerly vice-provost of Trinity College, Dublin. Of her numerous publications may be mentioned: *Irish Idylls*, 1892; *Strangers at Lisconnel*, 1895; *Creel of Irish Stories*, 1897; *Irish Neighbours*, 1907; *Irish Ways*, 1909; *Flaws*, 1911.

Barlow, Joel (1754-1812), American politician and writer, born in Connec-

ticut; pub. his bombastic poem *The Vision of Columbus*, 1787, expanded into *The Columbiad*, 1807. He went to France, 1788, and became a violent Republican; *Advice to the Privileged Orders*, 1791; *Hasty Pudding*, burlesque poem, 1793; he was American consul at Tangier, 1795-97, and ambas. to France, 1811. He died near Cracow, on a visit to Napoleon. *See* C. B. Todd, *Life*, 1866; and M. C. Taylor. *Three Men of Letters*, 1895.

Barlow, Peter (1776–1862), Eng. mathematician, was born at Norwich. From 1806 to 1848 he was professor

His studies in magnetic attraction, on which he pub. a treatise (1820), led to improvements in the compass, and the pattern he introduced remained in use till superseded by the Thomson compass in 1876. He was a F.R.S., 1823, and Copley medallist, 1825.

Barlow, Thomas (1607-91), Bishop of Lincoln, was fellow and tutor at Oxford, where he was noted as a keen controversialist and casuist. He was provost of Queen's College and Bodley's librarian, 1642 and 1660. He was made Archdeacon of Oxford, 1661, and Bishop of Lincoln, 1675. He was the writer of innumerable pamphlets and books, and a violent opponent of Roman Catholicism. Through all the political changes of his long life he managed to retain all his clerical benefices and preferments. His works include *Gunpowder Treason, Popery, Exercitationes aliquot Metaphysicæ de Deo*, and *Concerning the Invocation of Saints*.

Barlow, Sir Thomas (*b.* 1845), physician, graduated at London University, 1874, and became fellow of the Royal College of Physicians, 1880. He is physician-extraordinary to His Majesty King George V., as he was to their late Majesties, Queen Victoria and King Edward VII. He was created a baronet and K.C.V.O. in 1901; fellow of the Royal Society, 1909, and was president of the Royal College of Physicians, 1910.

Barlow, Thomas Oldham (1824–89), Eng. line engraver and mezzotinter, made R.A. 1881; he reproduced in line and mezzotint many of the works of his contemporaries, including Landseer, Turner, *Millais*, etc.

Barlow, William Henry (1812–92), British engineer; he supported the use by engineers of the steel produced by the Bessemer process; the chief works on which he was from time to time engaged include the building of St. Pancras Station, London, the Clifton Suspension Bridge, and the Tay Bridge.

Barm, *see* YEAST.

Barmecides, a noble Persian family, whose sudden fall from greatness under the Abbaside caliphate is proverbial. Khalid ben Barmak was minister of Mansur, and his son Yáhyá tutor and later vizier to the great Haroun, in whose reign the family reached their highest power and prosperity, his sons Fadl and Ja'afar enjoying high favour. In 803 the whole family, save one, were exterminated. The romantic but not improbable story is that Haroun discovered that Ja'afar had betrayed the caliph's sister after a marriage which was to be purely formal. It is likely that Haroun felt himself powerless in the hands of the family. The mock banquet or proverbial 'Barmecide feast' is well known from the *Arabian Nights*, 'Barber's Tale.'

Barmen, a tn. Rhenish-Prussia, Germany, on the Wüpper and the Aix-la-Chapelle-Berlin main line. It joins Elberfeld. It is one of the chief manufacturing tns. of modern Germany, a centre of the textile industry, especially ribbon weaving, of machinery, cutlery, plated goods, and buttons. Dyeing and bleaching, soap-making and chemical works are also large industries. Pop. (1905) 156,148.

Barmouth, a seaside resort, Merionethshire, N. Wales, in Cardigan Bay, at the mouth of the Maw. Pop. (1901) 2214. Cader Idris lies across the Maw, and the Vale of Llangollen and Dolgelly afford beautiful excursions.

Barn, *see* FARM and FARM BUILDINGS.

Barnabas, St., by descent a Levite of the country of Cyprus, his first name being Joses, or Joseph. The name of B. (son of consolation) was given to him by the apostles as appropriate to his character and works of charity. Alexander, a monk of Cyprus, says that he was brought as a youth to Jerusalem to study under Gamaliel. He is first mentioned in Scripture in Acts iv. 34. He it was who first introduced St. Paul to the apostles. Later he induced him to leave Tarsus and come to Antioch. He is supposed to have been martyred in Cyprus, but many traditions take him to Milan, Rome, and Alexandria.

Barnabas, The Epistle of St. There is still extant an epistle ascribed to St. Barnabas consisting of two parts, the first in Lat., the second in Gk. In the Gk. copy some parts are missing. The first is an exhortation, an argument to constancy in the belief and profession of the Christian doctrine. The second contains moral instructions. The N.T. is not quoted in it. Internal evidence shows that it

was written at the time of the destruction of the temple. Origen and Clement of Alexandria believed it to be authentic, and Lardner was also of that opinion, but it is generally now believed to be pseudonymous, and to be written by a Christian writer somewhere about the year 120.

Barnabites, a religious order, founded about the year 1530 under the name of Regular Clerks of the Congregation of St. Paul; they are so called because they first met in 1538 in the cloister of St. Barnabas at Milan. Their principal object was the education of the young. They were forbidden also to accept any preferment in the church save at the express command of the pope. The order spread to France, Germany, Austria, and Spain. They were suppressed during the time of the French Revolution, but returned in 1850. In 1880 they were expelled from France, but still exist in the other mentioned countries.

Barnaby, Sir Nathaniel (*b.* 1829), British naval architect, was born at Chatham of a family of shipwrights. In 1854 he became an admiralty overseer, and from 1870-85 he was chief naval architect in the offices of the controllers of the navy. He has pub. several works on shipbuilding, and in 1885 was created K.C.B.

Barnacle, Bernicle, or *Balanus*, is a genus of marine crustacean of the order Cirripedia and family Balanidæ. The testa is in six pieces, either conical or cylindrical, and its appearance has given it the vulgar name of acorn-shell (*q.v.*). The term is also applied to the genus *Lepas*, or shipbarnacle, found attached to floating objects. Both genera are cosmopolitan.

Barnard, Lady Anne (1750–1825), Scottish authoress, the daughter of the fifth Earl of Balcarres, James Lindsay; married, in 1793, Andrew Barnard, Colonial Secretary at the Cape of Good Hope, 1797. She returned from S. Africa in 1802. Her beautiful ballad *Auld Robin Gray* was written, 1772, to music by Rev. W. Leeves, and pub. in 1783. She only acknowledged the authorship in 1823 to Scott. *See* W. H. Wilkins' Memoir with original version—Scott's additions are poor—in *South Africa a Century Ago*, 1901, a series of her letters to Lord Melville.

Barnard, Frederick (1846-96), Eng. artist; studied at Heatherley's Art School and in Paris. First work, set of charcoal drawings, 'The People of Paris.' Contributed to *Punch*, 1863-5; cartoonist to *Fun* for two years. His best-known work is his illustration of the household edition of Dickens, 1871-9. 'Character Sketches' from Dickens and Thackeray; illustrations of *Pilgrim's Progress*, 1880. Also painter in oils. *See* Speilmann's *History of Punch*, 1895; *Merry England*, Dec. 1888; Harper's *English Pen-artists*, 1892.

Barnard, Henry (1811–1900), American reformer of education, born Hartford, Conn., educated at Yale; was a member of the Conn. legislature and reorganised the state schools, 1837-42. In various offices he reformed education in Rhode Is., Wisconsin, and Maryland, and was first Commissioner of Education to U.S.A., 1867-70. His publications are numerous, and as an educationalist he is of the first rank, more especially as founder and editor of the invaluable *American Journal of Education*, 1855-81. *See* A. D. Mayo, *Rep. U.S. Comm. of Educ.*, 1896-97 (1898).

Barnard, Sir John (1685–1764), was born at Reading, and brought up as a Quaker, but conformed to the Church of England when nineteen years of age. He entered the counting-house of his father, a wine merchant in London, and was soon entrusted with the entire management. He was responsible for the withdrawal of the bill which was to affect the interest of the wine merchant. Soon after he was elected M.P. for London, which he continued to represent for nearly forty years, taking a very active part in the debates, and generally voting with the party opposed to the administration of Sir Robert Walpole. He was elected an alderman of London 1728, was knighted 1732, and was lord mayor of London 1737. In the same year he brought forward a plan for reducing the interest of the national debt to the general rate of interest, which was then very low, but the measure was defeated. He retired from public life in 1758.

Barnard Castle, a tn. of Durham, England, on R. Tees, 15 m. N.W. of Darlington. Pop. 4421. It contains the ruins of a 13th-century castle built by Barnard Baliol, grandfather of John Baliol, King of Scotland. The Rokeby of Scott's novel of that name is 2½ m. distant. The chief manuf. is flax thread.

Barnard College, for women, was founded by President Frederick A. P. Barnard of Columbia, in 1889, on the refusal of the trustees of Columbia College to admit women on equal terms with men. B. C. is affiliated with the Columbia University, and in 1910 it was agreed that the president of that university should, ex officio, be president and a trustee of B. C. The students register in the university and read for degrees. In 1889 there were thirty-six students, which number had increased in 1908 to 580.

Barnardo, Thomas John (1845-1905), Eng. philanthropist, born in Ireland, and came to study medicine at the London Hospital, where he became interested in the condition of destitute children. In 1867 he opened his first 'home of refuge' in Commercial Road, and since then over 100 establishments have been set up. In 1873 he founded a 'village home' of fifty-two cottages at Ilford, Essex; where girls are trained in home conditions. Large numbers of the children, after education, are successfully placed in Canada and other British colonies. In 1891 the Young Helpers' League was instituted to enlist the help of well-to-do children.

Barnato, Barnett Isaacs (1852–97), great financier, son of humble Jewish parents of Aldgate, educated under Moses Angel at Jews' Free School, Spitalfields; in 1873 went to S. Africa as conjurer and entertainer; later assumed the name of B., and traded as diamond dealer at Kimberley. In 1880 he estab. the London firm of Barnato Brothers; in 1881 floated the Barnato Diamond Mining Company, Kimberley. In 1888 amalgamated with De Beers Company, controlled by Cecil Rhodes. B. was a member of Kimberley divisional council from 1880; member for Kimberley in Cape Assembly, 1888 and 1894. He invested in mining and other property in the Rand (Transvaal), and was chief manipulator of the 'Kaffir boom,' London, 1895, suffering heavy losses afterwards. B. drowned himself during a voyage from Cape Town. *See* Raymond's *Memoir*, 1897; *Cecil Rhodes*, by Vindex, 1900; Fitzpatrick's *Transvaal from Within*; McCall Theal's *South Africa*.

Barnaul, cap. of dist. of same name, Tomsk, Siberia, at junction of Rs. Ob and Barnaul, 230 m. S.W. of Tomsk. It is the administrative centre of the Altai mining dist., and has large smelting works, which receive the gold, silver, lead, and copper ores. Pop. 29,408.

Barnave, Antoine Pierre Joseph Marie (1761-93), Fr. revolutionist, born at Grenoble; became an advocate and early attracted attention in the town Parlement. In 1789 he represented Grenoble in the States-General, where for some time he had much influence as a leader of the popular party. He was one of the founders of the Jacobin Club, and successfully claimed the right of making peace or war for the National Assembly, in opposition to Mirabeau, who wished to leave it with the king. In 1791 he was one of the commissioners who brought Louis XVI. back from Varennes to Paris, and his sympathy seems to have been aroused, as after this he advocated more moderate and constitutional measures. In 1792 he was impeached on a charge of royalist sentiments, and guillotined in 1793. *See* his *Life* by Salvandy (1833) and Janin (1860).

Barnay, Ludwig, Ger. actor, born at Budapest, 1842. First theatrical appearance in Trautenau, 1860. 1861 engaged in Budapest, playing in most large towns of Austria and Germany. 1867 went to Leipzig state-theatre; 1868 to court-theatre at Weimar; 1870-5 member of Frankfort theatre; 1875-80 of Hamburg theatre. For the next few years B. 'starred' various tours, often appearing in *Meininger*. 1888 B. founded his own theatre in Berlin, and retired in 1894. Some of his chief rôles are Tell, Esser, Othello, Mark Antony, Lear, Hamlet, Kean, Wallenstein.

Barnburners, a political faction in American history. They were so called about 1844 on account of their enthusiastic support of radical reforms, which was compared with the rigour of the Dutchman who burnt down his barn to destroy the rats. They grew dissatisfied with the scanty recognition they received in the Democratic National Convention of 1848, and accordingly joined the Free Soilers in supporting the presidential candidature of Van Buren. In 1852 they compromised with their former opponents, the Hunkers, and were subsequently known as the 'Softs' or 'Soft-shells.'

Barnby, Sir Joseph (1838–96), Eng. musician and composer, born at York; educated at Royal Academy of Music. In 1862 he became organist at St. Andrew's, Wells Street, London; in 1864 conductor of Barnby's choir; conducted oratorio concerts at St. James' and Exeter Halls; in 1872 succeeded Gounod as conductor of the Royal Albert Hall Choral Society; in 1875 became musical director at Eton College; and in 1892 principal of the Guildhall School of Music. He was knighted in 1892. He composed numerous hymn tunes, church services, anthems, trios, part songs, and oratorical works, including the motet *King All Glorious*, the oratorio *Rebekah*, 1881, and *The Lord is King*, a setting of the 97th Psalm.

Barnes, a tn. of Surrey, situated on the r. b. of the R. Thames, 2¼ m. E. by N. of Richmond. It is on the south-western outskirts of London, on the London and South-Western Railway, and is also served by a service of motor omnibuses from London. Pop. 19,000.

Barnes, Albert, an American theologian, born at Rome, in the state of New York, on Dec. 1, 1798. He was educated at Princeton theological

seminary. After being in charge of a church in New Jersey, he became the minister of the first Presbyterian church at Philadelphia in 1830. He was tried for heresy, on account of the tone of some of his *Notes to the Epistle to the Romans*, but was acquitted. He was a gifted preacher, and latterly belonged to the new school of Presbyterians. He resigned, on account of failing eyesight, from Philadelphia in 1867, and died in that city on Dec. 24, 1870. He is best known for his notes to various books of the Old and the N.T., which, being very lucid and direct, are admirably adapted for Sunday schools and Bible classes.

Barnes, Joshua (1654-1712), classical scholar, was born in London. He was educated at Christ's Hospital, and afterwards went to Emmanuel College, Cambridge. He was elected regius professor of Greek at Cambridge in 1695; in 1700 he married Mrs. Mason of Hemingford, a widow lady with a good jointure, a large part of which he devoted to the publication of his Homer; in 1711 he wrote to Harley three letters, which are preserved in the Harleian Collection (Br. Mus. 7523), begging for preferment, but in vain. His widow erected a monument to his memory at Hemingford. His original writings are of little value: one is a history of Edward the Third, 1686-8, fol. His name is best known for his ed. of Homer, 1711, 2 vols. 4to, and of Euripides, 1694, fol.; and is preserved from oblivion only by its connection with that of Dr. Bentley.

Barnes, Thomas (1785-1841), editor of *The Times* from 1817. He was educated at Christ's Hospital and Pembroke College, Cambridge, taking his degree in 1808. He took up the profession of journalism in London, and was a member of the literary circle which included Leigh Hunt, Hazlitt, and Charles Lamb. He was at first an advanced Liberal, but his opinions had sufficiently changed to enable him to take over the editorship of *The Times* when Dr. Stoddart retired in 1817. He was responsible for the remarkable change in the outlook of the paper, which took place between 1831 and 1835; his recognition of the course of public opinion, aided by some personal feeling against Brougham, was the reason of this. His talents were of the highest order, and he was undoubtedly the director and controller of *The Times* in its general tone and outlook. He died on May 7, 1841, from the effects of an operation.

Barnes, William (1800–86), Eng. clergyman, philologist, and poet, born at Rushay, Dorsetshire. In 1823 he went to teach in a school at Mere, Wiltshire; in 1835 became master of the grammar school at Dorchester; in 1847 was ordained and became curate of Whitcombe; in 1862 became rector of Winterbourne Came, where he spent the rest of his life. His Dorsetshire poems exhibit a deep love of nature as seen in his native co., and a deep sympathy with a keen knowledge of his rustic neighbours, and have a general air of tender joyousness which is very pleasing. They are steeped in Dorset lore and written in the Dorset dialect. The three collections appeared under the names of *Poems of Rural Life; with a Glossary and Dissertation*, 1844; *Homely Rhymes*, 1859; and *Poems of Rural Life*, 1879. He also wrote a vol. of *Poems of Rural Life in Common English*, 1868. As a philologist he attempted to restore Saxon English, replacing Latin words by new native compounds. He expounded his theories in *Outline of English Speechcraft*, 1878. *See* his *Life* by his daughter, Mrs. Lucy Baxter, 1887.

Barnet, a tn. of Hertfordshire, England, 11 miles north of London. An obelisk near the town marks the site of the battle of 1471, in which the Lancastrians, under Warwick, who was killed in the fight, were defeated by Edward of York. There are now three suburbs, New B., Friern B., and E. B., and the town is connected with London by electric tramways. Pop. 7876.

Barnett, John (1802-90), Eng. composer, *b.* at Bedford; composed songs, part songs, instrumental music, and operas. His works include: *The Omnipresence of the Deity*, 1830; *Lyrical Illustrations of the Modern Poets*, 1834; *The Mountain Sylph*, 1834; *Fair Rosamund*, 1837; *School for the Voice*, 1844.

Barnett, John Francis, F.R.A.M. (*b.* 1837), Eng. musician and composer, born in London; studied at Royal Academy of Music, London, and Leipzig Conservatorium; became professor at the Guildhall School of Music and the Royal College of Music. In 1861 he played at a Gewandhaus concert at Leipzig, and his first noteworthy composition, *Symphony in A Minor*, was performed in 1864 by the Musical Soc. of London. His works, mainly cantatas, include: *The Ancient Mariner*, 1867; *Paradise and the Peri*, 1870; *The Lay of the Last Minstrel*, 1873; *The Raising of Lazarus*, 1876; *The Building of the Ship*, 1880; *The Wishing Bell*, 1893; *Liebeslied im alten Styl*, 1895.

Barnett, Samuel Augustus, Eng. clergyman and philanthropist, born at Bristol, 1844, becoming Canon there, 1893. One of the founders and warden of Toynbee Hall, Whitechapel, 1884-1906, becoming president 1906.

This organisation aims at raising the moral and intellectual level of a poor district of London by the personal example and efforts of university men. Canon of Westminster, 1906; president of the Sunday Society. Curate, St. Mary, Bryanston Square, 1867-72; vicar, St. Jude's, Whitechapel, 1872-94. Chairman, Whitechapel Board of Guardians, 1894, also Children's Country Holiday Fund. Select preacher, Oxford, 1895; Cambridge, 1899 and 1905. B. has pub. *Practicable Socialism* (with his wife), 1893; *Service of God*, 1897; *Religion and Progress; Towards Social Reform*, 1909.

Barneveld, a vil. in Gelderland, 17 m. N.W. of Arnhem, Netherlands; pop. about 8000.

Barneveldt, Jan van Olden (1547-1619), a Dutch statesman, grand pensionary of Holland. He was born at *Amersfoort in Utrecht*. He studied law and divinity at Heidelberg and the Hague, and at the latter settled down as an advocate in 1569. He was appointed one of the advocates of the court, and was chosen counsellor and pensionary of Rotterdam in 1576. In his capacity as advocate-general and grand pensionary, B. headed a deputation to England to make a formal offer of the revolted provs. of the Netherlands to Queen Elizabeth. B. now became leader of the republican party, opposed the war policy of Prince Maurice, and brought about a truce with Spain in 1609, which lasted twelve years. He took the side of the Arminians against the Calvinists, who were supported by Maurice. In 1616 B.'s influence was increased by his having obtained from James I. the restoration of the cautionary towns, which had been given up to Elizabeth as securities for the money which she had lent the states by the treaty of 1585. In 1618 a national synod, known as the Synod of Dort, was summoned to settle the great struggle between the Arminians and the Gomarites. B. and his friends, *Grotius* and *Hoogerbeets*, were arrested, and the trial of the prisoners commenced Nov. 19, 1618. B. was found guilty, and was beheaded in the courtyard of the Hague on May 14, 1619. *See* Motley's *Life of Barneveldt*, 2 vols., 1874.

Barney, Joshua (1759 – 1818), a distinguished American naval officer, was born at Baltimore, N. America. He entered the naval service, and at the age of seventeen obtained the commission of lieutenant in the United States navy. When in active service on board the *Saratoga* he was placed as prize-master of a captured British ship. When in an almost sinking condition he was taken prisoner by an English 74-gun ship and sent to England. In 1782 he escaped from prison and returned to America, where, as commander of a small ship of war, he captured a brig belonging to the British navy off Delaware. For this he received the thanks of the legislature of Pennsylvania and was promoted to the rank of commodore. He was afterwards sent with despatches to Dr. Franklin in Paris and returned with the news of the signing of preliminary articles of peace between England and America, 1784. When war broke out in 1812, he joined in a land attack at Bladensberg, and received a wound in the leg from which he never recovered. He died at Pittsburg.

Barnfield, Richard (1574–1627), Eng. poet, *b.* at Norbury, Shropshire, and spent most of his life at Stone, Staffordshire. He wrote numerous Spenserian sonnets and pastorals. His works include: *The Affectionate Shepherd*, 1594, a pastoral based on Virgil's second eclogue; *Cynthia, with certain Sonnets and the Legend of Cassandra*, 1595; *The Encomion of Lady Pecunia*, etc., 1598, which contains two of his best songs, 'As it fell upon a day,' and 'If music and sweet poetry agree.' These were reprinted in *The Passionate Pilgrim*, 1599, and attributed to Shakespeare.

Barnsley, a tn. of W. Riding, Yorkshire, England, on R. Dearne, 12 miles north of Sheffield. It is in a rich coal-mining district, and has manufactures of textiles, glass, iron, needles, paper, wire, and boots and shoes, besides bleaching and dye works. The town dates from pre-Norman times, but contains few old buildings. It was incorporated in 1869, and has a fine public hall, a park of 20 ac., libraries, baths, etc. The B. Canal connects it with Leeds and Wakefield. *Pop.* 41,086.

Barnstaple, seaport of Devon, England, on R. Taw, 6 m. from the mouth, 34 m. N.W. of Exeter; pop. 14,137. It contains a 14th-century par. church, an old grammar school, endowed in 1649, and occupying part of a ruined monastery, at which the poet John Gay was educated, and some quaint old houses in Bontport Street. The riv. is crossed by a 12th-century bridge of sixteen arches. The silting up of the tidal harbour has robbed the town of its commercial importance, but there are manufs. of lace, gloves, and pottery (Barum ware). It was formerly a centre of broadcloth weaving.

Barnstable, a seaport and post tn. in the United States of N. America, cap. of B. co., Massachusetts, is situated in 41° 42′ N. lat., 69° 17′ W. long., on the S. side of B. Bay, which opens

into Cape Cod Bay. There is a bar across the mouth of the bay, with 6 or 7 ft. of water. From 50-60 fishing and coasting vessels belong to the port. B. is 74 m. S.E. from Boston. *Pop. (1900) 4364.*

Barnum, Phineas Taylor (1810-91), American showman, born at Bethel, Connecticut; entered a country store in 1823; went into the lottery business in 1828; in 1829 married and went to Danbury, where he ed. *The Herald of Freedom.* In 1834 he removed to New York and made a considerable profit by exhibiting Joyce Heth. In 1841 he bought the American Museum in New York, and soon made it famous by his collection of real and pretended wonders. In 1847 he acted as manager for Jenny Lind, and in 1871 estab. his 'Greatest Show on Earth.' He pub. an *Autobiography*, 1854, *enlarged in 1888; Humbugs of the World*, 1865; *Struggles and Triumphs*, 1869; and *Money-getting*, 1883. *See* his *Life* by Benton, 1902.

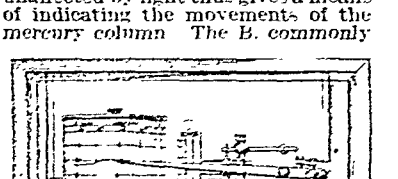
Baroach, Broach, or Bharuch, an anct. city and modern dist. in the N. division of the Bombay Presidency, British India. The city is situated on the r. b. of the Nerbudda, 203 m. N. of Bombay. It has cotton and flour mills. The district has an area of 1467 sq. m., and cultivates crops of cotton, millet, wheat, and pulse. Pop. of the dist. 300,000, of the town 48,000.

Barocchio, Barozzi, or Barocchi, Giacomo da Vignola (1507–73), a famous It. architect. *See* VIGNOLA.

Baroche, Pierre Jules (1802–70), Fr. advocate and minister of state, *b.* in Paris; became an advocate in 1823; in 1847 entered the Chamber of Deputies as member for Rochefort; in 1848 was elected to the Constituent Assembly; in 1850 became minister of the interior, and in 1851 minister of foreign affairs. Having become a partisan of Louis Napoleon, he was appointed president of the Council of State after the *coup d'état* of 1851, and in 1863 he became minister of justice. At the fall of the second empire in 1870 he fled to Jersey, where he died.

Baroda: 1. Native state in Gujarat div. of Bombay, India. The ter. is very scattered, but the total area is somewhat over 8000 sq. m. It is ruled by a feudatory Mahratta chief known as the Gaikwar. The dist. is very fertile. Pop. 1,953,000. 2. Cap. city of above state, on R. Vishvometre, 218 m. N. of Bombay, with which it is connected by railway. It has fine waterworks, constructed in 1892, and contains B. College, the palace of the Gaikwar, known as Lakshmi Villas, the Naulakhi Wells, the State Library, the Dufferin Hospital, an Anglo-Vernacular School, etc. It has a large trade in grain, flax, cotton, and tobacco. Pop. 103,800.

Barograph. an instrument by which the variations of atmospheric pressure are permanently recorded. An efficient B. for use in connection with a mercurial barometer is provided by placing a moving strip of photographic paper behind the upper part of the mercury column. The light is concentrated by a lens upon the top of the column, which partly obscures the paper slowly passing behind a narrow slit. The width of the paper unaffected by light thus gives a means of indicating the movements of the mercury column. The B. commonly

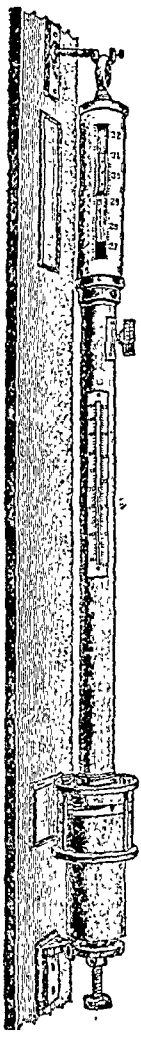


BAROGRAPH

used with barometers of the aneroid pattern consists of a system of levers by which the movements of the collapsible chamber are communicated to a pointer, which acts as a pen and makes records on a chart wound round a cylinder revolving by clockwork once a day or once a week. To be of any value as a trustworthy recorder the different parts of the apparatus should be of high quality and should be frequently tested.

Barometer, an instrument for measuring the weight or pressure of the atmosphere. The action of a suction pump in raising water was explained prior to 1643 by the principle that 'nature abhors a vacuum.' Galileo had observed that water could not be raised by the ordinary pump more than about 32 ft., and he recommended the study of the matter to his pupil Torricelli, who made the following experiment in 1643: A glass tube, about 3 ft. long, closed at one end, is completely filled with mercury and inverted, the open end placed in a trough of mercury, and the thumb removed. The mercury at once falls in the tube to within 10 in. of the level of the mercury in the bath, the space above forming what is known as the 'Torricellian vacuum.' As mercury is about 13½ times as heavy as water, Torricelli concluded that the force required to support the column of mercury would support a column of water of the same diameter and about 34 ft. high, and that the action of the pump and the sustaining of the

column of mercury both depended on the pressure of the atmosphere acting on one side of the liquid column. The validity of the conclusion was proved by Pascal, who caused Torricelli's experiment to be performed on the summit of the Puy de Dôme. The column of mercury was found to be 3 in. lower, showing that the pressure supporting the liquid diminishes with ascent to higher levels of the atmosphere. Pascal also performed experiments with water, oil, and wine, and found that columns were supported the heights of which were inversely proportional to the specific gravities of the liquids; and that in each case a weight of about 15 lb. of liquid was supported upon one square inch of surface. Any variations in the height of the Torricellian column are accounted for by variations in the pressure of the atmosphere, so that such an instrument, when suitably fitted up for permanent use, forms an efficient barometer.

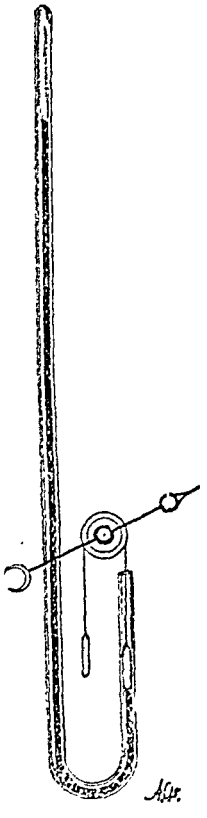


FORTIN BAROMETER

Cistern barometers.—The simplest form of cistern B. consists of a glass tube about 33 in. long, containing mercury and dipping into a cistern also containing mercury. It is fastened to a wooden stand, on the upper part of which is a brass scale indicating the height above the average level in the cistern. The instrument is liable to the 'error of capacity;' that is, any diminution in the amount of mercury in the tube raises the level in the cistern, and *vice versâ*, so that the scale does not always indicate the correct height of the column. In *marine Bs.* this error is avoided by graduating the scale, not in true inches, but in spaces which have been arrived at empirically as representing the correct height. In *Fortin's B.*, the bottom of the cistern is made of leather, and can be pushed up by means of a screw until the surface of the mercury in the cistern touches the end of a fixed ivory point, which is the starting-point of the scale. The glass tube is encased in a brass cylinder with two slits about 6 in. long on opposite sides to enable the top of the mercury column to be plainly seen. A brass collar with a vernier scale slides over the scale on the brass cylinder; the collar is provided with two slits slightly wider than the slits in the cylinder, and the scale is adjusted by bringing the upper edge of the slits down to the topmost point of the convex curve at the top of the mercury column. It is necessary that the mercury column should be exactly vertical for the scale to give a correct [illegible] Cardan's [illegible] is fixed [illegible] a collar which swings on a horizontal axle pivoted in a surrounding ring, which in its turn swings on an axle at right [illegible] port. Another error to which cistern Bs. are liable is due to *capillarity*, or the reluctance of the surface of the mercury—a liquid which does not 'wet' the glass—to rise to the height determined by pressure. This error may be diminished by using tubes of more than eight-tenths of an inch in diameter.

Syphon barometers.—The simplest form of syphon B. consists of a bent glass tube; one arm is about 36 in long and is sealed, while the other arm is about 8 in. long and is open. Mercury is poured in and worked to the closed end until the long arm and part of the short arm are full. When [illegible] nd uppermost, the level in the [illegible] in. above the level in the open arm. To make an observation, therefore, the height of the mercury in both arms must be taken, the difference giving the true barometric column. Owing to the subtraction, the error of capillarity disappears, and there is no error of capacity. The [illegible] the observati possibility of [illegible] mercury at ti [illegible] such disadvantages that the instrument is not in favour for exact work. In the *Hook*, or wheel B., the observations are rendered easier by placing a glass float in contact with the mercury, having attached to it a thread which passes over a pulley. The

thread is pressed against the pulley by a small weight which almost balances the float. The movement of the pulley is communicated to a pointer which sweeps around a graduated dial, which also bears such inscriptions as 'stormy,' 'set fair,' 'very dry,' etc., giving information of doubtful value. In Gay-Lussac's form of the syphon B. the two arms are joined by a capillary tube. When inverted for carrying, the mercury is nearly all contained in the longer arm, and the capillary tube prevents the entrance of air. In Bunten's improved form the entrance of a small quantity of air is made of no account by the provision of a funnel or 'air-trap' between the cistern and the top of the mercury column. The air-bubbles are entrapped in the funnel, and therefore do not find their way to the Torricellian vacuum.



PRINCIPLE OF WHEEL BAROMETER

Corrections.—In mercurial Bs. for accurate work the scale is engraved on brass, the coefficient expansion of which is accurately known. The increase in length of the scale due to a rise in temp. thus tends to make the reading lower than it should be. On the other hand, the mercury also expands on a rise in temp.; its density therefore diminishes, and the height of the column supported by the atmospheric pressure is greater than at the standard temp., 0° C. or 32° F. The barometrical readings have therefore to be corrected for temp., and with many instruments tables are provided, indicating the corrections necessary to reduce the readings to 0° C. or 32° F. To apply the corrections for errors of capillarity it is necessary to know the internal diameter of the tube and the height of the *meniscus*, or curved surface. Reference to a table with respect to these two quantities will indicate the amount required to be added to the observed reading.

Variations in barometrical height are of two kinds, periodic and accidental. The periodic variations are those which occur with a fair amount of regularity at certain hours of the day. Accidental variations are those which depend on a variety of conditions: the direction of the winds, geographical position, and the amount of water vapour present in the air. In temperate lats. the accidental variations are by far the most important, and are so considerable as to render observation of any periodic variations very difficult. At the tropics, accidental variations are practically non-existent, and the daily fluctuations take place with great regularity. The cause of barometrical variations is the difference in the specific gravity of the air occasioned by differences in temp. Thus the B. tends to fall from noon until about four o'clock, as the air becomes lighter from the heating effect of the sun; it then rises until it reaches its maximum at about ten o'clock in the evening. In Western Europe, the warmest and lightest winds are those blowing from the tropics over the Atlantic Ocean; these usually affect the higher reaches of the atmosphere first, diminishing the total pressure, so that a fall in the B. usually indicates the advent of a moist S.W. wind, and therefore the possibility of rain. The B. is in this way useful as a guide to the probable weather; in other lats., however, it by no means follows that a falling B. is an indication of rain or stormy weather.

Uses of the barometer.—As indicated above, the B. may be used to foretell weather conditions if the peculiar circumstances of the region are known. It is also used as a hypsometer, or instrument to measure height above sea-level, as the density of the air for a constant temp. is proportional to the pressure of the superincumbent atmosphere. The B. is also used in physical experiment and in industry to indicate the pressure of gases in terms of atmospheric pressure. Standard atmospheric pressure is understood, in physics, to mean the pressure which sustains at the sea-level, and at a temp. of 0° C., a column of mercury 760 millimetres high. In engineering, the pressure of one atmosphere means a pressure equivalent to 15 pounds on each square inch

of surface. It has been suggested that the standard pressure should be represented in terms of force as one megadyne per square centimetre, this being equivalent to a barometric height of 29·513 in. at Greenwich, the acceleration due to gravity at that place being taken as 981·17 centimetres per second.

Barometz is a prostrate hairy stem of a fern about which an extraordinary superstition arose. It was called Scythian Lamb, and its shaggy appearance and crouching attitude gave rise to the fable that it was partly animal, partly vegetable, and devoured all plants in its vicinity.

Baron, a word of uncertain origin, introduced at the Norman Conquest to denote the 'man,' or vassal, of a great lord. Originally the term was of very wide application, but in England the process of limitation began early. The word was first restricted to those who held land directly from the king by military tenure, and by the 13th century the div. of these into 'greater' and 'lesser' Bs. had become common. Magna Charta in 1215 provided that the lesser Bs. should be summoned to the Great Council only through the sheriffs, while to the greater Bs., *i.e.* nobility from earls downward, a special summons should be sent by the king. This summons gradually became the badge of peerage, restricting the privilege to the greater Bs. alone. Till this point the position of a B. was that of a holder of the king's land, but the personal note became dominant in 1387, when the creation of Bs. by letters patent was commenced. In that year Richard II. created John de Beauchamp B. of Kidderminster. The practice, however, did not become general until the reign of Henry VI. The creation of Bs. by writ, formerly an ordinary proceeding, is now almost entirely discontinued. The B.'s coro-

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the retention of the freer use of the word. It designated the chief officials and parliamentary representatives of the five great southern ports in the House of Commons. On the Continent, the title is born by many people on various slender grounds. In France, only those bearing a name of historic note receive much status from their title, and in Germany, too, the title, which is handed down to all the children, has become quite dissociated from all idea of possession of land.

Baron and Femme, or Feme, Nor-man-Fr. words used to denote husband and wife in their mutual relationship. In heraldry the words denote the bearing of the arms of husband and wife per pale, *i.e.* side by side on the same escutcheon, the husband's always being on the dexter side.

Baronet, a dignity which was created by James I. in 1611, ostensibly to obtain funds for the defence of Ulster. Each B., therefore, was required to supply the funds for keeping thirty soldiers in Ireland (at the rate of 8*d.* per day) for three years. It was promised that the number of Bs. created should not exceed 200 and it was also stipulated that the honour could only be conferred on those who had a clear revenue of £1000 from lands, and whose family had borne arms at least as far back as his grandfather. It conferred the prefix 'Sir' on the B., and 'Lady,' or 'Dame,' on his wife, and gave him precedence over all other knights, but not over the younger sons of barons. In 1625 Charles I. instituted Bs. of Nova Scotia in Scotland. This was a scheme for the colonisation of that colony, and grants of land were made to the new Bs. who paid 3000 marks for the honour. The number, not to exceed 150, was never completed. In 1629 they received the right of wearing a badge, suspended by an orange-tawny ribbon, with a saltire azure, thereon an inescutcheon of the arms of Scotland, surmounted by an imperial crown, round the whole a motto, *Fax mentis honestæ gloria*. The creation ceased in 1707.

Baronius, Cæsar (1538–1607), a famous Roman Catholic ecclesiastical historian, was born at Sora in Naples, the son of Camillo Baroni and Porzia Feboria. He studied divinity and law at Naples, and afterwards at Rome, where he was the pupil of St. Philip Neri, whom he succeeded as superior of the congregation of the oratory, 1593. In 1596 he was made cardinal, and in 1597 librarian of the Vatican: but failed to become pope in 1605 owing to the opposition of the Spaniards. His most celebrated work, *Annales Ecclesiastici a Christo Nato ad Annum* 1198 (12 vols. 1588-1607), was written in reply to the Protestant work entitled *Magdeburg Centuries*, and its object was to show that the doctrine of the Church of Rome was identical with that of the early Christian Church. The *Annales* was continued by Raynaldus; by Bzovius to the year 1572 (9 vols. fol. 1616-72); and there is another extension to 1639 (2 vols. fol. Paris, 1639). The last ed. of this work is that of 1864-83. Another work of B. worthy of note is *Martyrologium Romanum*, 1586. According to Mazzuchelli (*Scrittori*

d'Italia, fol. Brescia, ii. pt. i. p. 387), there are nineteen works of Baronius in print and manuscript.

Baron of Beef, a large piece of beef consisting of both sides of the back, a double sirloin, sometimes weighing 100 lbs. This huge joint is only served at great public entertainments, notably at civic feasts at the Guildhall, London. The origin of the name is uncertain, but legend ascribes it, as well as Sir Loin, to a jest of Charles II.

Barons' War, The, *see* MONTFORT.

Baroque (from Portuguese, 'a rough pearl'), originally restricted to the jeweller's trade, but now chiefly used in architecture. The term signifies the extravagant, capricious, incongruous, but sometimes picturesque, ornament of the late Renaissance. It has much the same meaning as rococo.

Baroscope (Gk *βάρος*, pressure, and *σκοπέω*, to look) is a kind of barometer which indicates only variations in the atmospheric pressure, but does not, as the ordinary barometer does, supply any quantitative data.

Barosma, Buchu, or Bucku, is a name of a genus of Rutaceæ found in S. Africa as an evergreen shrub. The leaves are employed in medicine as a diuretic.

Barotac. or Barotac. Nuevo, a small tn. of Par . . ., situated in a Pop. 12,000.

Barotse Land, a former kingdom of Central Africa, in the Upper Zambesi. It now forms the district of North-western Rhodesia, the seat of administrative gov. being at Lialui. The dist. is well watered and fertile, and supports a large population of Bantus. There is a postal service from Lialui to Buluwayo.

Barousse, a valley in the Hautes-Pyrénées, France.

Barpeta, a tn. of British India, Assam, Kámrúp dist. Pop. (chiefly Hindus) about 9500.

Barque, or Bark, originally any small ship, but now more particularly a three-masted vessel, with fore and main masts square-rigged, but mizzen-mast rigged fore-and-aft. Formerly they were small vessels only, but now they often exceed 3000 tons.

Barquisimeto, cap. city of state of Lara, Venezuela, on B. Riv., 165 m. S.W. of Caracas. It is a bishop's see, and contains a college, cathedral, gov. palace, etc. It stands in a fertile agricultural and stock-raising dist., and does a large trade through its port, Tusacas. Pop. 31,476.

Barr, a small German tn. situated in the gov. of Alsace-Lorraine. It is 18 m. S.W. from Strasburg, and is noted for its mineral baths. Pop. 5700.

Barr, or Barra, a petty kingdom of Western Africa, at the mouth of the Gambia. This and some neighbouring kingdoms on the Gambia were founded by Amari-Sonko, a Mandingo warrior, apparently for the purpose of facilitating the operations of the traffic in slaves. His descendants still reign. The soil is very fertile, except where marshes occur, and is well cultivated.

Barr, Archibald, Scotch inventor, born in Renfrewshire, 1855. Educated at Paisley and Glasgow University, where he has been regius professor of civil engineering and mechanics since 1889. Invented with Stroud naval range-finders, adopted by British Admiralty and foreign govs.; also various range-finders for fortress and field service, electrical fire control instruments for use between fire control positions and gun stations of war-vessels (adopted by British Admiralty), and a pump for producing high vacua. The inventors have works expressly designed and equipped for manufacturing their scientific machines and instruments at Anniesland, Glasgow. B. has written papers and addresses on engineering subjects.

Barr, Robert (1850–1912), English novelist, *b.* in Glasgow. Educated at Normal School, Toronto; headmaster of Central School, Windsor, Canada, till 1876. Then joined editorial staff of *Detroit Free Press*, his contributions to which were signed 'Luke Sharp.' In 1881 B. came to England, founded the weekly *Free Press*, and in 1892 founded the *Idler* with Jerome K. Jerome, remaining co-editor till 1895. Among his best works are: *In the Midst of Alarms; A Woman Intervenes; Countess Tekla; From Whose Bourn; Revenge; The Strong Arm; The Mutable Many; The Unchanging East*, 1900; *The Tempestuous Petticoat*, 1905; *Stanleigh's Millions*, 1908; *Cardillac; The Sword-maker*, 1910.

Barra, a small tn. about 3 or 4 m. E. of Naples. Pop. 12,000.

Barra, a small is. of Inverness-shire, Scotland, near the southern extremity of the Outer Hebrides. Historically it is famous as the scene of the victory of Robert Bruce, 1308. Pop. 2500.

Barrackpur, a tn. of dist. Twenty four Parganas, Bengal, India, on R. Hugli, 15 m. N. of Calcutta. It is a European health resort and country residence of the viceroy. There were sepoy mutinies here in 1824 and 1857. The native name of 'Charnak' is reminiscent of Job Charnock, the founder of Calcutta. Pop. 18,000.

Barracks, a permanent residence for soldiers, sailors, or police. For an infantry battalion, 20 ac. of ground is required, for cavalry and artillery about 30 ac. The B. include parade ground and open spaces for drill and manœuvres. B. are generally built in blocks, to accommodate two companies each, and are divided into three parts, viz. officers' quarters, men's quarters, and quarters for married soldiers and sergeants. The officers' mess usually consists of a dining-room, club room, billiard-room, and offices. Each officer has his own private rooms, the number varying according to rank, and special accommodation is made for married officers. Each company has eight barrack-rooms, containing from ten to twenty beds, two sergeants' rooms, and two store-rooms, besides offices and lavatories. The married soldiers usually have separate houses each, with rooms varying in number according to the number of their children. The soldiers are catered for by the Regimental Institute, which consists of the canteen and the recreation establishment. Reading-rooms, coffee bars, gymnasiums, billiard-rooms, and other recreation rooms are provided in B. to make the life as comfortable and attractive as possible. There are separate buildings, used as hospitals, and school-rooms for the children.

Formerly accommodation was not provided for soldiers, who were accordingly billeted on the people. It was not till the end of the 18th century that permanent buildings for soldiers came to be built. Great sums of money have been voted from time to time for the construction of B. and the improvement of men's quarters. The Army Sanitary Committee is a permanent advisory body, and there is a Director of Barrack Construction at the head of a department of the War Office.

Barraconda, *see* GAMBIA

Barracuda, Barracouta, or **Barracoota**, a large pike-like fish of the family Sphyrænidæ and order Teleostei. Bs. are carnivorous, and some varieties are esteemed as a food, though at times they are poisonous.

Barrafranca, a tn. of Sicily, situated 1470 ft. above the level of the sea, 10 m. S.E. of Caltanissetta, in the prov. of that name. Pop. 10,878.

Barra Manza, a tn. of Brazil, on the r. b. of the Parahiba do Sul, 70 m. N.W. of Rio de Janeiro. Pop. 12,000.

Barramunda, a name sometimes applied to the Ceratodus, a dipnoid fish of the family Sirenoidei with a single lung. Its haunts are the rivs. of Queensland.

Barranquilla, cap. of prov. of same name, Bolivar, Colombia, on Magdalena R., near its mouth, 3 m. from its seaport, Sabanilla, and 18½ from the port Puert[illegible] at the head of [illegible] riv., which is [illegible] into the sea, the tn. has a busy steamship traffic, and is rapidly growing, though it suffers from periodical floods. Pop. 40,000.

Barrantes, Vincente (1829 – 98), Spanish poet and publicist, born at Badajos, but later removed to Madrid, where he entered literary and political life, holding several appointments in Spain and the Philippines. In 1872 he was made a member of the Spanish Academy. His works, for the audacity of which he was sev. times fined, include *Siempre Tardé*, 1851; *Juan de Padilla*, 1855-6; *La Viuda de Padilla*, 1857; *Narraciones Extramcñas*, 1872-3; *Cuentos y Leyendas*, 1875; *Guerras Piraticas de Filipinas*, 1878.

Barras, Paul Jean François Nicolas, Comte de (1755-1829), a member of the Fr. Directory, and an important figure in the Fr. Revolution, was born at Fos-Emphous in Var, of an anct. noble family. In 1775 he entered the army, and went twice to India. When the Revolution commenced he became one of its warmest partisans, and was a member of the Jacobins' Club from its commencement. Representing Var in the National Convention, he voted for the death of Louis XVI.; and he also took an active part in the siege of Toulon. He opposed Robespierre, and was mainly instrumental for his downfall. On the 13th Vendémiaire (Oct. 5, 1795), the Convention appointed B. general-in-chief for the second time, and his success on this occasion was chiefly owing to Bonaparte, to whom he had confided the command of the artillery. The anarchists were put down and B. was nominated one of the five members of the Directory. On the 18th Fructidor (Sept. 4, 1797), he was again invested with dictatorial powers, and transported many of his opponents. The affair of the 30th Prairial (May 18, 1799), however, shook the foundation of the Directory. Bonaparte, seconded by Sieyes, effected the revolution of the 18th Brumaire (Nov. 9, 1799), and was made first consul. After this the power of B. was annihilated. Implicated in a conspiracy, he was exiled to Rome, but returned to Paris in 1814. In 1815 he again left Paris, but returned on the disembarkation of Napoleon and took up his residence at Chaillot. *See* his *Memoirs*, pub. by Duruy, 1895.

Barratry, derived from an old Fr. word meaning to barter or cheat. The offence in English common law is one

of stirring up or inciting the subjects of the king to riot. The offence against law is only actionable when committed frequently, and at least three breaches of the law must be proved against the offender. In the case of a lawyer or solicitor offending in this way he is by the law of England unable to practise further. The offence in Scotland is not the same as in England, but is the term used to describe the crime of a judge who barters justice for money, *i.e.* is guilty of corrupt practices. The offence of B. is also known in marine insurance: in that case it is an offence by the masters or crew of a ship which is to the detriment of the owners or insurers of that ship. It is usually insured against in marine insurance policies.

Barraux, a vil. in the Fr. dept. of Isère, in the arron. of, and 23 m. from, Grenoble. On the Isère, upwards of a mile from B., is B. Fort, built by Emmanuel of Savoy in 1596 and captured by Lesdignières. Pop. of vil. 1200.

Barre, a banking tn. of Vermont, Washington, U.S.A., 6 m. from Montpelier. It is famed for its granite-quarries. Pop. about 7000.

Barré, the name given to a group of S. American tribes of Arawakan stock, who occupy the country round the Upper Rio Negro, in Northern Brazil, across the Cassiquiari, Guiania, Atabo as far as Venezuela. They are an independent, progressive race, and are thought to be absorbing the neighbouring tribes. Their language has spread throughout a wide region.

Barré, Isaac (1726–1802), British officer and politician, born in Dublin, the son of a Fr. refugee; served under Wolfe, and was wounded at Quebec in 1759; entered parliament in 1761, and consistently defended the rights of the colonies, notably in a famous speech against the Stamp Act in 1765. He was the originator of the term 'Sons of Liberty' applied to the Americans. In 1790 he retired owing to blindness consequent upon his old wound. He is one of those to whom the *Letters of Junius* have been ascribed.

Barrel, large wooden vessel for holding liquids or solids, with circular heads. The term is also given to various measures. A barrel of beer contains 36 imperial gallons, of wine 31½ gallons, of butter 224 pounds, etc. In the U.S.A. flour and beef are sold in the same way, a B. of flour containing 196 pounds, and one of beef 200 pounds.

Barrelier, James (1606–73), a distinguished botanist, was *b.* in Paris. He was educated for the medical profession, but abandoned it, and in 1635 took the vows of the order of Dominicans. In 1646 he was appointed assistant to the general of the order of Dominicans, and in that capacity traversed Southern France, Spain, and Italy. During his travels he collected plants, of which he made drawings, and had them engraved. He returned to Paris, 1672, to complete his work on botany, but died in 1673. After his death his collections were dispersed, and some were burnt. The copper plates, however, were collected and published by Antoine de Jussieu, who supplied descriptions in the place of those which had been destroyed.

Barrel-organ, a portable mechanical musical instrument of monotonous tone and limited number of tunes. Provided with hymn-tunes, it was formerly used in some churches, but has been ousted by the harmonium; at the end of the 18th century it was first used in the street. The organ has a wooden cylinder furnished with pegs or staples, which, when revolved, opens a series of valves to admit the air to a set of pipes, and thus produces the sounds.

Barren Flowers are more commonly known as male flowers. They bear stamens but no carpels.

Barren Island is the name given to four different islands in various parts of the world. The first is a sandy is off the S. shore of Long Is., King's co., New York. The second is an is. on the W. coast of Placentia Bay, off Newfoundland. The third is one of the group known as Hunter Islands, off the north-eastern point of Tasmania. The fourth is a volcanic is. in the Bay of Bengal, situated to the E. of the Andaman Islands.

Barrenness, *see* STERILITY.

Barrenwort, or *Epimedium alpinum*, is a species of Old World Berberidaceæ which is cultivated in Britain. It is a self-pollinated plant, with nectaries, and the seed has a membranous aril.

Barrès, Maurice (*b.* 1862), a Fr. man of letters, was born at Charmes, in the Vosges. After studying at Nancy he went in 1882 to Paris, and adopted the journalistic profession. He was elected a deputy for Nancy in 1889, and sat in the chamber till 1893. He is an individualist by conviction, and repudiates all social discipline. His works are obscure in many places, and possess many mannerisms, but his analysis is very delicate, and his style, though often affected, is pure. His works include *L'Ennemi des lois*, 1893; *Le Culte de Moi*, 1893; *Une journée parlementaire*, 1894, etc.

Barret, George (1732–84), an Irish landscape painter. In 1764 he ob-

tained a 50-guinea premium from the Society of Arts, London; was one of the original members of the Royal Academy, founded 1768; and towards the close of his life was master painter to Chelsea Hospital. His landscapes are bold and natural in design, but his colouring is somewhat peculiar and heavy. He painted also in water-colours, and executed a few etchings.

Barrett, Lawrence (1831–91), an American actor, *b.* at Paterson, N.J. He made his first appearance on the boards at Detroit, Mich., as Murad in *The French Spy* in 1853. In 1857-8 he was associated with the brilliant actor Edwin Booth; subsequently he became the leading member of his company, and worked with him from 1887 till his death. B. was a versatile actor and had a high intellectual understanding of his art. His best part was Cassius; he was also very successful as Richelieu and Lanciotto, and took the leading parts of many Shakespearean plays. He wrote *Edwin Booth and his Contemporaries*, 1886.

Barrett, William (1733-89), an Eng. surgeon and antiquary, was born at Notton, Wiltshire. At the age of twenty-two he passed his examination for a surgeon, and settled down to practise in Bristol. He determined to write a history of the city. This work is famous because of the number of forgeries with which Chatterton, 'the marvellous boy,' supplied B., and which the latter accepted without question. He was made a fellow of the Society of Antiquaries on Nov. 9, 1775, before the publication of his book. This appeared in 1789, as a quarto volume of over 700 pages, with the title, '*The History and Antiquities of the City of Bristol, compiled from original records and authentic manuscripts, in public offices and private hands*, illustrated by copper-plate prints. By William Barrett, surgeon, F.S.A.' The book was received with such a chorus of ridicule and obloquy that B. was overwhelmed, and died at Higham, in Somerset, in the following September.

Barrhead, a tn. of Renfrewshire, Scotland, 6 m. S. of Glasgow by rail. It contains cotton-mills, calico-printing works, bleaching and dyeing works, engineering works, and shawl-weaving mills. Pop. 9855.

Barri, Giraldus de, or Sylvester Giraldus, *see* GIRALDUS CAMBRENSIS.

Barrias, Louis Ernest (1841-1905), a Fr. sculptor, brother of Felix Joseph B., was *b.* at Paris. He studied at first under Leon Cogniet, but recognising that sculpture was his true *métier*, he worked under Carelier and Jouffroy, and went through a course at the School of Fine Arts. He was awarded the Prix de Rome in 1865, and a medal at the Salon of 1870. His two works for the Salon of 1872, one in marble, the other in bronze, were of such excellence that he was awarded a first-class medal. He was awarded a medal of honour and a decoration for his piece at the 1878 Salon, entitled 'The First Funeral,' representing Adam and Eve bearing the body of Abel. In 1884 he was created a member of the Academy of Fine Arts.

Barricade, a military term used for any obstruction formed to check the advance of an enemy. They may be constructed of palisades and earth or sand-bags, with loop-holes cut for firing, but as they are generally thrown up in haste any material to hand, such as loaded carts, heaps of stones, planking, felled trees, etc., is used. In 1358 Bs. were set up in the streets of Paris against the Dauphin Charles, and again in 1588 Henry VI.'s troops were prevented from entering Paris by the Bs. They were used again in Paris in the Revolutions of 1850 and 1848. There was a B. erected by Londoners in 1821 in order to change the route of Queen Caroline's funeral. On board ship, a B. is a strong wooden rail, supported by stanchions, the upper part containing rope-netting stuffed with full hammocks to prevent the effect of small shot in an action.

Barrie, the cap. tn. of Simcoeco., Ontario, Canada, on Kempenfeldt Bay, L. Simcoe, 64 m. N.W. of Toronto. It is a railway centre, and has manufs. of carriages, wool, leather, and machinery. Pop. 6000.

Barrie, James Matthew, novelist and dramatist, *b.* 1860, at Kirriemuir, in Forfarshire, was educated at Dumfries Academy and Edinburgh University. After some experience as a journalist in Nottingham he came to London and contributed, among other papers, to the *St. James's Gazette*, *British Weekly* (as 'Gavin Ogilvy'), *National Observer*, and *Speaker*. In 1887 he pub. his first book, *Better Dead*, and in the next year *Auld Licht Idylls* presented an idealisation of his native vil. as 'Thrums,' with its life and humour. The theme is not quite dropped in *When a Man's Single*, primarily a humorous account of journalistic life, and it is again the chief interest in *A Window in Thrums*, 1889. In 1891 came *My Lady Nicotine* and *The Little Minister*, which excellently showed Mr. B.'s whimsical humour, pathos, and control of action and dialogue. *Margaret Ogilvy*, 1894, was followed by *Sentimental Tommy* and *Tommy and Grizel*, 1900. His dramatic career began with *Walker, London*, in 1892, and in collaboration

with Conan Doyle he then wrote *Jane Annie*. In 1895 came *The Professor's Love Story*, in 1897 a dramatisation of *The Little Minister*, and in 1900 *The Wedding Guest*. After this, two notable successes were *The Admirable Crichton* and *Little Mary*. Christmas 1904 was marked by the production of the children's play, *Peter Pan*, which shows many of the author's most charming and characteristic gifts. In 1905 came another play of the same type, *Alice-sit-by-the-Fire*, and in 1908 *What Every Woman Knows* followed. Among his one-act plays, *The Twelve-Pound Look* is perfect in style and deservedly popular.

Barrier, from the Fr. word *barrière*, in fortification, is a term applied to a chain of military posts protecting the frontiers of a country. It signifies, also, a wall of strong timbers enclosing an area (stockade), or protecting a passage. In some part of a B. is a gate usually formed of two parts, opening in the middle, and frequently musket-proof, being made of strong timbers in vertical and horizontal positions, with diagonal braces.

Barrier Act, an act passed by the *General Assembly of the Church of* Scotland in 1697 providing that any proposed change in the church laws must be sanctioned by a majority of the Presbyterians. The object of this act was to guard against hasty legislation in the church.

Barrier Reef, The Great, *see* GREAT BARRIER REEF.

Barrier Treaty, the name given to three treaties which were drawn up during or immediately after the War of the Spanish Succession. It was essential to the Dutch that, in order to resist possible Fr. aggressions, they should have control of the 'barrier' fortresses of the Netherlands. The chief fortresses which the Dutch demanded were Ypres, Tournai, Mons, Charleroi, and Ghent. In return for a recognition of the Protestant and Hanoverian succession Great Britain signed a treaty in 1709 by which she undertook that the Dutch should be provided with an adequate barrier of fortresses in the Netherlands. The number of fortresses was reduced by the second treaty to practically those already named (1713). In the treaty which was signed in 1714 by the Emperor and Louis XIV. the Dutch received their barrier fortresses.

Barring-out, a practice formerly common in schools, by which the boys barred the doors of the school against the master. The time chosen was usually a few days before the commencement of the vacations. Addison was the leader of a B. at the Grammar School, Lichfield, 1685 (*see* Johnson's *Life of Addison*); and at the High School, Edinburgh, in 1595 there was a serious B. in which a magistrate lost his life whilst endeavouring to force an entrance. In the statutes of Witton School, near Northwich, in Cheshire, founded by Sir John Deane, 1558, the observance of the custom by the scholars is directed.

Barrington, The Honourable Daines 1727–1800), the fourth son of John Shute B. He was called to the bar in 1749, and made a puisne Welsh judge in 1757. In 1785 he gave up all public employments except the place of commissary-general of the stores at Gibraltar. Of his writings the most important is *Observations upon the Statutes, chiefly the more ancient, from Magna Carta to the* 21 *Jac. I. c.* 27, first pub. 1766. Others are: *Researches respecting a North-West Passage;* papers on local antiquities in the *Archæologia;* and essays in the *Philosophical Transactions*. Many of his periodical publications were pub. in 1781 under the title of *Miscellanies on various Subjects*.

Barrington, George (properly Waldron, George) (1755– *c.* 1840), Irish author, born at Maynooth, Kildare; joined a band of strolling players in 1771, and later became a professional thief in London, moving in the highest circles. His most noted theft was that of a snuff-box worth £30,000 from Prince Orloff. In 1790 he was transported to Botany Bay, but was released after two of his seven years' sentence, and became superintendent of convicts and later High Constable at Paramatta, N.S.W. His works include: *A Voyage to Botany Bay*, 1801; *The History of New South Wales*, 1802; *The History of New Holland*, 1808, and a prologue to a convict representation of Young's tragedy *The Revenge*, containing the famous line 'We left our country for our country's good.'

Barrington, John Shute, first Viscount (1678–1734), English polemical writer and politician, born in Hertfordshire; called to the bar in 1699; was one of the commissioners sent to Scotland to gain the favour of the Presbyterians for the Union; became a commissioner of customs in 1708, and entered parliament in 1715. In 1720 he was made baron and viscount in Ireland. He was expelled from parliament in 1723 for his connection with the Harburg lottery. His works include: *Essay upon the Interests of England in Respect to Protestants Dissenting*, etc., 1701; *Rights of Protestant Dissenters*, 1704-5; *Dissuasive from Jacobitism*, 1713; *Miscellanea Sacra*, 1725.

Barrington, Samuel (1729–1800), British admiral, son of Viscount B

Entered the navy under Lord George Gordon in 1740; became a lieutenant in 1745; commanded the sloop *Weasel* in 1747; and later in that year, in the *Bellona*, captured the Fr. *Duc de Chartres*. He served in the Mediterranean and on the Guinea Coast; in 1754-5 accompanied Commodore Keppel to N. America; in 1757 served under Sir Edward Hawke in the Basque Roads Expedition; and in 1761 under Keppel at Belle Isle. In 1759, while commanding the *Achilles*, he captured the *Comte de St. Florentine*. He was made commander-in-chief in the West Indies in 1778, where he defeated the Fr. under D'Estaing. He was in the action off Grenada in 1779, and was second in command to Lord Howe at the relief of Gibraltar in 1782. He was made an admiral in 1787.

Barrington, Shute (1734 – 1826), Eng. churchman, sixth and youngest son of John Shute, Viscount B., was born at Becket, in Berkshire. He was educated at Eton and Merton College, Oxford. He was ordained in 1756, and appointed chaplain-in-ordinary to George III. in 1760. He was made canon of Christ Church in 1761, and took his D.C.L. in the following year. He was appointed a canon of St. Paul's in 1768, and bishop of Llandaff in 1769, of Salisbury in 1782, and of Durham in 1791. He was a strong defender of the Protestant establishment, and heartily opposed to the acquisition of any political power by the Roman Catholics. He was twice married, but left *no children*.

Barrington, William Wildman (1717-93), an Eng. politician, eldest son of John Shute, Viscount B. After making the 'grand tour,' he returned to England in 1738, and in 1740 was unanimously elected M.P. for Berwick-on-Tweed. In 1745 he formulated a plan for a national militia, and in the same year took his seat in the Irish House of Lords. He was one of the lords commissioners of the Admiralty in 1746, in 1754 M.P. for Plymouth, and in 1755 a member of the Privy Council. He was secretary of war in 1755, chancellor of the exchequer in 1761, treasurer of the navy in 1764, and in 1765 secretary of war again. He was joint postmaster-general from January to April 1782, and retired on a pension of £2000 per annum.

Barrios, Justo Rufino (1835-85), an American politician, was born at San Lorenzo, in Guatemala. He took part in the unsuccessful liberal insurrection under Serapio Cruz against Cerna, the president of Guatemala, in 1867-69. He was obliged to flee to Mexico, but in 1871 he returned and defeated Cerna, and assisted to make Granados president. Two years later he overthrew Granados and took his place, being re-elected in 1876 and again in 1880. Seeing that his ideal of a union of Central American states would never be attained by peaceful means, he invaded Salvador in an attempt to bring about his aims by force. He was, however, defeated and killed at Chalchurapa.

Barrister, a member of that branch of the law which has the exclusive right to practise and be heard in the superior courts of law in England and Ireland. For the Scottish equivalent branch *see* ADVOCATE. The right to practise at the bar is confined to the four Eng. Inns of Court (*q.v.*), viz. Lincoln's Inn, Inner and Middle Temples, and Gray's Inn, and to the King's Inns in Ireland. A student is 'admitted' to an Inn by passing a preliminary examination (excused for those who have passed certain University examinations), and paying fees. He then 'keeps' twelve terms by eating dinners in the hall of his Inn, six in each legal term, three for university members. On passing the examinations of the Council of Legal Education and paying fees he is 'called to the bar' by the benchers of his Inn, who may refuse to admit. They also may 'disbar' or expel a barrister for misconduct. Clergymen, women, solicitors, or account ants in practice may not be admitted. On his call or before, a barrister usually passes a year as pupil in the chambers of a practising barrister, and if he intends to practise at the common law bar usually joins a circuit (*q.v.*). Before undertaking a case he must be instructed in a 'brief' (*q.v.*) by a solicitor, but in criminal cases he may be engaged directly in open court. He drafts 'pleadings' (*q.v.*), gives opinions on the case, advice on evidence, etc., and it is his especial and peculiar function to conduct the case in court. A barrister is not answerable for anything said by him in court, so long as it is suggested by his instructions and is relevant to the case. He may not sue for his fees, but is not obliged to return them though he cannot attend the court. He is not liable for negligence. The attorney- and solicitor-generals are leaders of the bar; king's counsels, K.C.'s, are appointed by the lord chancellor on application; they are called 'within the bar' and are said to 'take silk,' their gown of special form being of silk for dress occasions, when they also wear a full bottomed wig; a K.C. does not accept conveyancing or pleadings, he must have a junior briefed with him, and does not take pupils in his chambers. The

ordinary barrister, or junior bar, wears a 'stuff' gown. For counsel appointed to revise the lists of parl. voters *see* REVISING BARRISTER.

Barroccio, Federigo (1528-1612), an Italian painter, *b.* and *d.* at Urbino, the son of an eminent sculptor. He first studied under Battista Venezano, then under Cardinal della Rovera at Rome, whose palace he ornamented with sev. frescoes. After four years he returned to Urbino, and painted a picture of St. Margaret for the Confraternity of the Holy Sacrament. At the invitation of Pope Pius X. he assisted in the embellishments of the Belvedere palace, on which Zucchero was also engaged. Here he executed the Annunciation in fresco on one of the ceilings, and a picture of the 'Holy Virgin with the Infant Saviour, with Saints.' His other works include an altar-piece of the 'Taking down from the Cross' in the cathedral of S. Lorenzo at Perugia; a picture of the 'Last Supper' for the Chiesa della Minerva; and the 'Visitation of the Virgin Mary to Elizabeth' and the 'Presentation in the Temple' for the Chiesa Nuova.

Barrois, Le, was an ancient div. of France in Lorraine, which now forms almost the whole dept. of Meuse. The prin. tns. were Bar-le-duc, the cap., Commercy, Saint Mihiel, and Port à Mourson. It is well wooded, and noted for its wines.

Barros, João da (1496-1570), a Portuguese historian. In 1522 he was sent as governor to St. George da Mina, on the Guinea Coast; in 1525, recalled to Lisbon, he was appointed treasurer to the colonial dept., and afterwards agent-general for the colonies. While he held this office he composed his great work, *Asia Portugueza*, or the history of the discoveries and establishments of the Portuguese in the Indian seas. He is considered by the Portuguese their best historian, and is therefore called the 'Livy of Portugal.'

Barrosa, a vil. of Andalusia, Spain, on the coast, 16 m. S.E. of Cadiz. The scene of the victory of General Graham over the Fr. under Victor in March 1811, being one of the first Eng. victories in the Peninsular War.

Barros-Arana, Diego, a Chilian historian, was born about 1824. He was professor of geography at the university of Santiago, and Chilian minister at Buenos Ayres. He formed one of the commission which studied the delimitation of the frontier between Chili and the Argentine Republic. His works, which are in Spanish, include: *General History of the Independence of Chili*, 1854-7; *Elements of Physical Geography*, 1881; *General History of Chili*, 1884, etc.

Barroso, Miguel (1538-90), Spanish painter, born at Consuegra. According to Palomino he was a pupil of Becerra, and distinguished both as architect and painter. Employed by Philip II. in the Escurial, he painted a number of frescoes in the chief cloister there, including 'Resurrection,' 'Christ appearing to the Apostles,' 'Descent of the Holy Ghost,' 'St. Paul Preaching.' In 1589 painter to the king. *See* Stirling, i.; Meyer, *Kunst. Lex.* iii.

Barrot, Camille Hyacinthe Odilon (1791-1873), Fr. orator and statesman, was *b.* at Villefort (Lozère). He studied law at Paris, and was called to the bar there. Though remaining a supporter of monarchy, he was dissatisfied with the restoration gov.; in 1827 he joined the 'Aide-toi' association. He took a prominent part in the revolution of July 1830, being a member of the Municipal Commission of the Hôtel de Ville, and one of the three commissioners appointed to conduct Charles X. out of France. He was then appointed prefect of the Seine dept. He opposed the extreme republicans and advocated a constitutional monarchy on democratic lines. In the movement of 1847, which culminated the next year in revolution, he was again prominent, being one of the great speakers at the 'banquets.' The revolution came as a surprise to him, and he acquiesced in the republic, and accepted office, but he was soon dismissed. After the *coup d'état* of 1851, he retired into private life, deeply discouraged at the failure of his schemes on all sides. After the fall of the empire, Thiers nominated him President of the Council of State, but he died after having held this position only a year.

Barrow (Sax. *beorg*, hill or hillock), the name given to the burial mounds erected by the primitive peoples over the remains of their dead. The custom was widely spread, and remains of Bs. have been found all over Europe, in N. Africa, Asia Minor, various other parts of Asia, and N. America. The structure, size, and internal arrangement of the Bs. differ widely. They were made of earth or stones, and the ground-plan was oval, round, or oblong. The long Bs. of the Stone Age in Great Britain contained one or more chambers entered by a passage under the higher and broader end of the B. They were from 200 to 300 ft. in length, with a width of from 60 to 80 ft. In Ireland round Bs. were the rule. The practice of B. burial was accompanied both by cremation and inhumation. The introduction of cremation in the Stone Age is thought by some to have introduced the vogue of smaller Barrows.—a distinguishing

feature of the Bronze Age, in which cremation was common. In the Iron Age the size again becomes larger. With the remains were frequently buried the favourite animal and familiar possessions of the departed. A vivid account of the building of the B. of Hector is given in the *Iliad*, and Herodotus gives a detailed description of a similar custom in connection with the burial of the Scythian chiefs. Amongst the Vikings it was a custom to place the dead man on the deck of his ship and erect the B. over it. The largest Eng. example is Silbury Hill, 130 ft. high. *See* Greenwell's *British Barrows*, Petrie's *Histories and Antiquities of Tara*, Squier and Davis's *Ancient Monuments of the Mississippi Valley*.

Barrow, a riv., Ireland, rises on the N.E. side of Slieve Bloom Mts., Queen's Co., flows E. to border of co. Kildare, then S. With the Suir, which it joins 29 m. from the sea, and the Nore, which flows into it 2 m. above New Ross, it forms the estuary of Waterford harbour. Length 119 m. Navigable for vessels of 300 tons as far as New Ross, for barges up to Athy. Here it joins the Grand Canal.

Barrow, Cape, the most northerly point of Alaska. There is a gov. station on the cape.

Barrow, Isaac (1630-77), divine and mathematician, son of the linen-draper to Charles I., educated at Charterhouse and Felsted; entered Peterhouse College, Cambridge, 1643, under his uncle who was a fellow. The Presbyterians having taken possession of Peterhouse, B. removed to Trinity College, Cambridge. As a boy his prin. delight was fighting and his habits negligent; but here he worked hard, and became a fellow in 1647; took his M.A. 1652, and was made D.D. by royal mandate in 1670. He first intended to study physic but turned to theology; gradually he was led to astronomy and geometry. Meanwhile he studied the classics diligently and was recommended for the chair of Gk. at Cambridge; he lost it, being suspected of Arminianism. Then he went abroad (1655-59) through France and Italy to Constantinople, and thence to Venice, Germany, Holland, and home again. In 1660 he was chosen Gk. professor, and in 1662 Gresham Professor of Geometry, but this he resigned on his appointment to be Lucasian Professor of Mathematics, 1663. This he resigned (1669) in favour of his great pupil Isaac Newton. In 1672 Charles II. (whose neglect of him he celebrated in his well-known Lat. lines) appointed him master of Trinity College, and he exerted himself to form a library, the need of which had long been felt. He died young considering his reputation, at the age of forty-seven. He never married, and lived a life of constant resignation of profit upon principle. His two mathematical works were *Lectiones Opticæ* and *Lectiones Geometricæ*, both of which were highly esteemed by Newton. Among his theological works are: *Expositions of the Creed; The Lord's Prayer; Decalogue;* and *Sacraments*. His treatise on the Pope's supremacy is still admired as a specimen of controversy. An edition of these was edited by Napier with a memoir by Whewell, 9 vols., 1839.

Barrow, Sir John (1764 – 1848), diplomatist, writer, and patron of Arctic exploration, was a native of Dragley Beck, Lancashire. He became a time-keeper in a Liverpool iron-foundry, but managed to educate himself in other directions. After a trip to sea in a Greenland whaler he became a teacher of mathematics at an academy in Greenwich. Here he was fortunate enough to secure the interest of Sir George Staunton, who obtained for him (1792) the post of secretary to Lord Macartney, the first British ambas. to China. In this position he distinguished himself by his mastery of the Chinese language and his close study of Chinese literature and science. On the appointment of Macartney to the governorship of the Cape of Good Hope, B. took an active part in the settlement of the affairs of that colony. From 1804-45 he was second secretary of the Admiralty. He was made a baronet in 1835. He was a fellow of the Royal Society, and one of the chief founders of the Royal Geog. Soc. His publications include: *Travels in Southern Africa*, 1803; *Travels in China*, 1804; *A Voyage to Cochin-China*, 1806; *History of Voyages into the Arctic Regions*, 1818; *Voyages of Arctic Discovery*, 1846; and an autobiography, 1847.

Barrow-in-Furness, seaport, manufacturing tn., and municipal, co., and parl. bor., N. Lancashire, 9 m. S.W. of Ulverston, 268 m. N.N.W. of London. Here are situated the famous shipbuilding yards of Vickers Sons and Maxim, Ltd., the Bessemer steel works, and other large industries connected with iron and copper, which are found in considerable quantities in the vicinity. There are also jute and flax factories, engineering shops, paper and pulp works, etc. There is an active trade at the port in imports of cattle, general merchandise, timber, flour, grain, coal, etc., and exports, among other things, of steel rails, pig-iron, and iron ore. The rise of B. from a fishing vil. to an active industrial centre dates from the dis-

covery in 1840 of hæmatite ore at Park, near B. The establishment of mines and smelting-works soon followed, and the construction of many miles of railway by the Furness Railway Co. The docks, four in number, cover an area of 280 ac. Noteworthy buildings are the town-hall, erected at a cost of £80,000, and the picturesque ruins of Furness Abbey. B. returns one member to parliament. Pop. (estimated) 70,000.

Barrow Point, a long sandy point on the northern coast of Alaska.

Barrow Strait, Canada, joins Lancaster Sound and Melville Sound. Average breadth 50 m. Discovered by Parry, and named by him after Sir John B., the patron of Arctic exploration.

Barrulet, *see* HERALDRY.

Barry, a term in heraldry applied to a shield that is divided by horizontal lines into an even number of partitions of interchangeably disposed tinctures. According to the number of portions it is termed *B. of six, eight, or ten pieces. B. of six* is the most common, and figures in the armorial bearings of many noble families. *Barry-bendy* is the term used of a shield divided *B.* and *bendy*, *i.e.* by lines running from dexter chief to sinister base, etc., the tinctures being interchanged. *Barry-pily* is the term applied to a shield divided into an even number of partitions by piles placed barwise across it.

Barry: 1. Small is. in Bristol Channel. 2. Seaport of Glamorganshire, S. Wales, 7 m. S.W. of Cardiff, opposite B. Is. It has a tidal basin of 90 ac. between the mainland and the is., and large docks, opened in 1889, which cover 114 ac. and have accommodation for the largest vessels. There is an export trade in coal and iron, and the tn. is managed by a most progressive municipality. Pop. 27,000. 3. The name of a parish of Forfarshire, Scotland, 7½ m. S.W. by W. of Arbroath on the North British Railway. It has an area of 5328 ac. and a pop. of 4000.

Barry, Alfred (1826–1910), Eng. bishop, educated at King's College, London, and at Cambridge. Headmaster of Leeds Grammar School, 1854-62; prin. of Cheltenham, 1862; of King's College, London, 1868; examining chaplain to Bishop of Bath and Wells, 1869; Canon of Worcester, 1871; of Westminster, 1881; member of London School Board, 1871-7; chaplain in ordinary to the queen, 1877; primate of Australia, metropolitan of New South Wales, bishop of Sidney, 1884-9; canon of Windsor, 1891; assistant-bishop in W. London, 1897; rector of St. James's, Piccadilly, 1895-1900. Among Dr. B.'s works are: *Boyle Lectures*, 1876, 1877, 1878; *Life of Sir Charles Barry; Introduction to Old Testament; Christianity and Socialism*, 1891; *England's Mission to India; Hulsean Lectures; Position of the Laity*, 1903; *The Christian Sunday*, 1904.

Barry, Sir Charles (1795–1860), architect, was a native of Westminster. After serving his apprenticeship with a firm of Lambeth architects he travelled in Greece, Italy, Egypt, and Palestine. He started practice in London in 1820. His first important work was St. Peter's Church at Brighton. Subsequent notable designs were the Athenæum at Manchester, Halifax town-hall, King Edward's Grammar School at Birmingham, and the Travellers' and Reform clubs in London. In 1835 B. was successful in the competition for the design for the new Houses of Parliament, and was knighted by Queen Victoria at the opening of the Victoria Tower and Royal Gallery in 1852. He was elected R.A. in 1841, was a fellow of the Royal Soc., and member of many foreign academies. He was buried in Westminster Abbey. See *Life* by his son, Bishop Barry, 1867.

Barry, Elizabeth (1658–1713), an English actress. She is said to have been the daughter of Edward B., a barrister, and to have been patronised by Lady Davenant, but there is no certain foundation for these stories. She was introduced to the stage by the Earl of Rochester, making her first appearance in 1673 as 'Isabella, Queen of Hungary,' in the Earl of Orrery's tragedy *Mustapha*. Though she showed no talent whatever on her first appearance, she was later universally considered as one of the finest actresses of the time, and created over 100 rôles. Her life was as immoral as her talent was great.

Barry, James (1741–1806), born at Cork, the son of a coasting trader; made great progress as a youth, and at twenty-two went to Dublin. Here he was introduced to Edmund Burke, who brought him to London, and soon sent him to Rome, where he remained five years. He returned to England, 1770, where he offered to join the project to decorate St. Paul's Church with scriptural paintings. In 1775 he pub., in answer to Du Bos and Winckelmann, an *Inquiry into the real and Imaginary Obstructions to the Acquisition of the Arts in England*. He painted six pictures for the Society for the Encouragement of Arts, etc. His most famous picture is that of the 'Victors at Olympia.' Canova said that this was sufficient to bring him to England. He was elected professor of painting at the

Academy, but his quarrelsome spirit made him unpopular, and he was expelled. He died of a fever.

Barry, Sir John Wolfe Wolfe-, Eng. engineer, brother of Alfred, *b.* 1836; educated at Glenalmond, King's College, London, and Trinity College. While under Hawkshaw B. was engaged as resident-engineer during construction of bridges over Thames, and of stations at Charing Cross and Cannon Street. Later he built Blackfriars, Kew, and Tower Bridges; carried out Earl's Court, Ealing, and Fulham extensions of Metropolitan Dist. Railway; constructed B. Dock near Cardiff (largest in Great Britain), and other engineering works in various parts. B. visited the Argentine, 1872; planned railway from Buenos Ayres to Rosario; knighted 1897. Consulting er
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Barry, Lodowick, the author of a comedy called *Ram-Alley, or Merry Tricks*, first printed in 1611 and reprinted in Dodsley's *Old Plays*. For liveliness of incident and spirit and humour in dialogue and character it is one of the best of the old English dramas. Nothing is known with certainty about the author.

Barry, Comtesse du, Marie Jeanne Gomart de Vaubernier (1744-93), reputed daughter of an exciseman; at the age of fifteen became mistress to Count Jean du B., through whom she caught the attention of the licentious Louis XV. He wished her to appear at court, and to make this possible Count Jean's brother Guillaume married her; she was introduced at the court at Versailles in 1769. At the death of Louis XV. in 1774 she was shut up in a convent near Meaux, but soon after Louis XVI. released her and restored to her the house at Luciennes which the old king had given her, and allowed her a pension. At the Revolution she was forgotten, but she showed her gratitude by hastening to England in 1793 regardless of danger and selling her jewels for the use of the queen and her children. On her return she was brought before the revolutionary tribunal for being a conspirator and 'having worn black for the death of the tyrant.' She was executed, November 6.

Barry, Martin (1802–55), English physician, studied in Edinburgh, Paris, Germany (under Tiedemann), and London. Special study, embryology; 1839 contributed two papers on the subject to *Philosophical Transactions*. In 1843 B. gave physiological lectures at St. Thomas's Hospital, becoming house-surgeon to Edinburgh Royal Maternity Hospital, 1844. See *Edinburgh Medical Journal*, 1856; *Biographisches Lexikon der Herrvorragenden Aerzte*, 1884.

Barry, Sir Redmond (1813–80), Colonial judge, educated at Trinity College, Dublin; barrister 1838. In 1839 went to Sydney; becoming shortly commissioner of Court of Requests in Melbourne. 1850, on formation of colony of Victoria, B. was solicitor-general; in 1851 became judge; 1855 first chancellor of Melbourne University; knighted 1860; visited England 1862, becoming commissioner for the colony at International Exhibition, also at Philadelphia Exhibition, 1876; read papers on *Binding* and *Lending Books;* founded Melbourne Public Library and National Gallery. *See* Heaton's *Australian Men of the Time; Proceedings of Conference of Librarians*, 1877.

Barry, Spranger (1719–77), son of an eminent silversmith of Dublin, was born in Skinner Row of that city. He mismanaged his father's business so badly that he became bankrupt, and adopted the profession of an actor. His first appearance was made at the Theatre Royal, Dublin, on Feb. 15, 1744. He played for a time under Garrick, but in 1749 left Drury Lane for Covent Garden, and in both houses played *Romeo and Julict* in rivalry of each other simultaneously. B.'s performance of Romeo was considered by many to surpass that of Garrick. B. crossed to Ireland after a time, and opened theatres in Dublin and Cork, but returned to Garrick in 1767. He again went to Covent Garden, however, in 1774, where he played till his death. He had no tact, and was ignorant and lacking in judgment, but was nevertheless a great actor.

Barry Cornwall, *see* PROCTER.

Barry Railway Viaduct, across Taff R., Glamorganshire, Wales; spans two other railway lines and a canal. Length 1420 feet, height 112 feet.

Bars is a north-western co. of Hungary, the cap. of which is Aranyos Marót. It contains the two small adjoining tns. of O'Bars (Old Bars) and Uj Bars (New Bars), which are situated 57 m. to the N.N.W. of Budapest.

Bars-gemelles, *see* HERALDRY.

Barsi, or Bursi, a tn. of India in the Sholapur dist. of Bengal, which is noted for its cotton. Pop. 20,000.

Barsine: 1. Also called Statira, the daughter of Darius Codomannus and the wife of Alexander the Great. After the death of Alexander, she was put to death through the instigation

of Roxana, who feared that B. might give birth to a son, whose claims would clash with those of her own. 2. The daughter of Artabazus, satrap of Bithynia and wife of Memnon, a Rhodian. At the fall of Damascus, 335 B.C., she fell into the hands of Alexander the Great, and became the mother of his son Hercules. She and her son were afterwards murdered by Polysperchon, by the order of Cassandra.

Bar-sur-Aube, a tn. in the dept. of Aube on the riv. of the same name. Manufs. brandy, wool, and cotton; exports grain and wine. Originally a Roman fortress, destroyed by the Huns. Pop. 4500.

Bar-sur-Ornain, *see* BAR-LE-DUC.

Bar-sur-Seine, a tn. of France in the dept. of Aube, 19 m. S.E. of Troyes, situated on the l. b. of the Seine. In the middle ages it was a town of note. Pop. (1901) 3062.

Bart, Jean (1650-1702), born at Dunkirque, as a boy served under Admiral de Ruyter. Was in command of a frigate of the Fr. navy against the Spanish in the Mediterranean Sea. In the war with England he was captured and taken to Plymouth; he escaped, however, and was made a captain by the Fr. king. In 1690 he took command of a forty-gun ship and helped Admiral de Tourville against the combined English and Dutch fleets; he obtained command next year of a squadron that went up the North Sea and landed on the coast of Scotland, plundering several villages; made an attack on Newcastle after the Fr. defeat at La Hague. Retired after peace of Ryswick in 1697.

Bartan, or Bartin, River, the anct. Parthenius (*q.v.*).

Bartas, Guillaume de Saluste du (1544-90), born at Montfort, in Armagnac; followed the profession of arms; served Henry IV., and died from wounds received at the battle of Ury. His poem, *La Semaine, ou Création du Monde*, 1578 (probably imitated from Tasso's *Sette Giornate*), went through 30 eds. in six years, and was translated into six languages. He was greatly admired by Spencer. Indirectly he served to enrich our language by compounding words, which were imitated by Sylvester (his translator), Chapman, and Sir Philip Sidney. This Sylvester was admired by Dryden and Milton, and Fletcher owed much to him; in reference to his subject and genius he may be compared with Blackmore.

Bartels, Adolf (*b.* 1862), a German author and journalist. He was born at Wesselburen, in Holstein, and educated at Berlin. He has written poems, plays, and works of criticism and literary history. The following are among his best known works: *Dichterleben*, 1890; *Martin Luther*, 1903; *Geschichte der Deutschen Literatur*, 1901-2; and a biography of *Jeremias Gotthelf*, 1902.

Bartenstein, a tn. of E. Prussia, 34 m. S.S.E. of Königsberg, on the R. Alle. Pop. 7000.

Barter, the system of trading by the exchange of one commodity for another, as distinguished from the sale of commodities for money. It is the common method of exchange amongst primitive peoples, and is a phase in the economic history of all races. In civilised countries the custom has become practically extinct with the establishment of the money currency. In law, B., or exchange, is a contract for the exchange of two commodities.

Bartfeld, a tn. of Sáros, Hungary, on the R. Tapola, 28 m. N. of Eperies. It contains a 13th-century Gothic church and a 15th-century Rathaus, while 2 m. to the N. are famous chalybeate springs. The first general Protestant synod of Hungary met here. Pop. 6102.

Barth, a seaport of Pomerania, Prussia, on the Binnensee at the mouth of the B., 17 m. N.W. of Stralsund. The chief industries are shipbuilding, brewing, and fish-curing. There is a 13th-century church. Pop. 7100.

Barth, Heinrich (1821-65), German explorer, was a native of Hamburg. After studying at the university of Berlin, he made his first expedition to Africa, visiting Tunis, Tripoli, Benghasi, and travelling down the valley of the Nile. In 1847 he travelled in Egypt, Palestine, and other parts of the Near E. An account of these journeyings was given in his *Wanderungen durch die Küstenländer des Mittelmeeres* (1849). From 1849 to 1855 he was engaged with the British expedition of exploration in Central Africa. His experiences during these years he described in his *Reisen und Entdeckungen in Nord- und Centralafrika* (1857-8; Eng. translation, new edition, 1890). He subsequently made other journeys in Asia Minor and European Turkey. In 1863 he became professor of geography at the university of Berlin. His collection of Central African vocabularies (1862-4) is of great value.

Barthélemy, Auguste Marseille (1796-1867), writer of political verse, was a native of Marseilles. After completing his education at the Jesuit College of Juilly, he went to Paris in 1822. Here he distinguished himself by writing a series of brilliant satires against the Bourbons. In 1826 was pub. his mock heroic poem, *Le Villéliade*, written in collaboration with

his friend Méry. This was an enormous success, as was also his *Napoléon en Egypte* (1828). The frank imperialistic sentiments of *Le Fils de l'Homme* (1829) brought about his imprisonment, from which he was released by the revolution of 1830. This event he celebrated, in conjunction with Méry, in the brilliant poem, *L'Insurrection* (1830). From 1832 his popularity declined, owing to his support of government measures distasteful to the Liberal party. His changes of front he attempted to justify in his famous phrase, 'L'homme absurde est celui qui ne change jamais.'

Barthélemy, Jean Jacques (1716-95), a Fr. writer and antiquarian, born at Cassis, in Provence. In early life he was educated for the church, and spent much time in the study of Gk. and oriental languages, and antiquities, especially numismatics. In 1745 he became an assistant in the Royal Cabinet of Medals, and in 1753 was appointed its director. He received a state pension which enabled him to carry on his research work, but the Revolution deprived him of office in 1789. He was denounced as an aristocrat in 1793, but his release was procured the next day. Citizen Paré, the *pro tempore* Minister of the Interior, offered him the place of chief librarian of the Royal, now National Library, which he refused on account of his age. His best known work is the *Voyage du jeune Anacharsis en Grèce* (4 vols. 1788), which has been trans. into many languages; the English ed. being ed. by W. Beaumont (5th ed., 6 vols., 1817). Of his other works may be mentioned *Réflexion sur quelques monuments Phéniciens*, 1750; and *Réflexion sur l'Alphabet et la Langue de Palmyre*, 1754. A complete ed. of his works was brought out in 4 vols. with a biography in 1821.

Barthélemy Saint-Hilaire, Jules (1805-95), Fr. politician and savant, friend and literary executor of Thiers, was born in Paris. After occupying a minor position in the ministry of finance, during which time he contributed to the political press, he became in 1838 professor of Greek and Roman philosophy at the Collège de France. The revolution of 1848 again brought him into contact with politics as a member of the Assembly. On the occasion of the *coup d'état* he was one of the patriots who suffered imprisonment. After his release he vacated his professorship and devoted himself to oriental studies. As a member of the Bordeaux Assembly, to which he was elected in 1871, he proved himself a strong supporter of Thiers, and for some time acted as his secretary. In Jules Ferry's cabinet of 1880-1 he was foreign minister. His chief works are his '
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La Philosophie dans ses Rapports avec les Sciences et la Religion, 1889; and *François Bacon*, 1890. He also made a verse translation of the *Iliad*.

Barthez, Paul Joseph (1734-1806), a celebrated Fr. physician, was born at Montpellier. Here he studied medicine with such success as to obtain his doctor's degree at the early age of nineteen. In 1756 he was employed as a physician to the army, but soon returned to Paris to edit in part the *Journal des Savants* and the *Encyclopédie Méthodique*. In 1759 he was appointed professor at Montpellier, and became chancellor of the university in 1785. He settled in Paris in 1780, and gained a great reputation in the practice of medicine. His chief work, *Nouveaux Eléments de la Science de l'Homme* (1778), expounds his doctrine of vitalism. Amongst his other works are: *Oratio de Principio Vitali Hominis*, 1773; *Nova Doctrina de Functionibus Corporis Humani*, 1774; *Nouvelle Mécanique des Mouvements de l'Homme et des Animaux*. 1798; and *Traitement des Maladies Goutteuses*, 1802. Appointed physician to Napoleon, 1802. Died of fever. Pub. posthumously, *Traité du Beau*, 1807; *Consultations de la Médecine*, 1810.

Barthold, Friedrich Wilhelm (1799-1858), a Ger. historian, born in Berlin. He studied at the universities of Berlin and Breslau, and in 1831 was appointed professor of history at Greifswald. His chief publications are as follows: *Der Römerzug König Heinrichs von Lützelburg*, 1830-1; *Geschichte von Rügen und Pommern*, 1839-45; *Geschichte der Deutschen Städte und des Deutschen Bürgertums*, 1850-2; *Geschichte der Deutschen Hansa*, 1854.

Bartholdi, Frédéric Auguste (1834-1904), sculptor, was born at Colmar, Alsace, his father being of It. descent. His most famous work is the Liberty statue ('Liberty enlightening the World') on Bedloe's Is., New York, commissioned by the Fr. gov. and presented to the American nation to commemorate the centenary of its independence. This huge figure, 220 ft. high, was unveiled in 1886. Amongst B.'s other well-known work are the Lafayette statue, New York, 'The Lion of Belfort,' the monument to Vercingetorix, the Gaulish leader, and 'Grief.'

Bartholine, or Bartholin, Thomas (1616-80), son of Kaspar; a distinguished physician and professor of Copenhagen. He visited the most celebrated schools of Europe. In 1637 he went to Leyden, where he repub-

lished his father's *Anatomiæ Institutiones*, with additions, in 1641. He also visited Paris, Montpellier, Padua, Malta, and Basle, where he took the degree of doctor of medicine, having chosen for his thesis *De Phrenitude*, 1645. In 1647 he was appointed professor of mathematics in the university of Copenhagen, which in 1648 he exchanged for the chair of anatomy, which he held till 1661. In 1670 he was appointed physician to the king and became librarian for the university; afterwards, in 1675, the king appointed him a member of the grand council of Denmark. He pub. numerous works on medical subjects, and was an ardent supporter of Harvey's doctrine of the circulation of the blood. *See* Haller's *Bibliotheca Medica*, 1776-8, and *B. Anatomica*, 1774-7.

Bartholine, or Bartholin, Thomas (1659-90), the son of the above, eminent in the science of jurisprudence. Studied at the universities of Copenhagen, Leyden, Paris, Leipzig, and Oxford. Appointed professor of history and civil law at Copenhagen, and held the offices of assessor of the consistory, secretary to the king, antiquary and keeper of the royal archives. His chief work is *Antiquitatum Danicarum Libritres*. 1689.

Bartholinus, Kaspar (1585–1629), a Dan. scholar, born at Malmö, Sweden, and died at Copenhagen. He became professor of rhetoric in the University of Copenhagen in 1611, of medicine in 1615, and of theology in 1624. His text-book, *Institutiones Anatomicæ*, 1611, was trans. into Eng., Fr., and Ger., and was used throughout Europe during the 17th century. He had two sons, who were distinguished scholars: Jacob (1623-53), an orientalist, and Thomas (1616-80), a physician, professor of mathematics in the University of Copenhagen in 1646 and of medicine 1647-61. He revised his father's *Institutiones Anatomicæ* in 1611, and himself wrote on anatomy and medicine. His son, Thomas, 1659-90, was the author of *Antiquitatum Danicarum Libri Tres*, 1689.

Bartholomé, Paul Albert (*b.* 1848), a Fr. painter and sculptor. He was born at Thiverval, Seine-et-Oise. He studied under Barth. Menn in Geneva and later entered the studio of Léon Gérome in Paris. He exhibited genre pictures at the Salon from 1879-86, his best being 'Souper de vieillards,' 1880; 'Les derniers épis;' 'L'aïeule coupant du pain pour ses petits enfants.' Since 1891 he has exhibited sculptures at the Salon. 'Aux morts,' 1899, now placed in the Père Lachaise cemetery, is one of the finest pieces of modern sculpture.

Bartholomew, Edward Sheffield (1825-58), an American sculptor. He was born in Connecticut, and became, in succession, a dentist, painter, and sculptor. He was director of the Wadsworth Gallery at Hartford, where there is a large collection of his works. He studied art in New York, and then lived in Italy till his death, at Naples. His best known statues are, 'Youth and Age,' 'Sappho,' 'Ganymede and the Eagle,' and 'Eve Repentant.'

Bartholomew, Massacre of St., the name given to the massacre of Huguenots which commenced in Paris on St. Bartholomew's Day, Aug. 24, 1572, and spread through the provs. during the succeeding weeks. The total number of those killed has been estimated at figures varying from 30,000 to 70,000. In Paris alone 4000 perished. The outrage owed its inception to the cruelty and cunning of Catharine de Medici, who, as regent for her son Charles IX., after provoking the eight years' conflict between the Catholics under the Duke of Guise and the Protestants under the Prince of Condé, during which both leaders lost their lives, lured the Huguenots into a sense of security by marrying her daughter, Margaret, to the Protestant Henry of Bearn (afterwards Henry IV.). She then worked upon the king's feelings in such wise as to convince him that Admiral Coligny, the Huguenot leader, had designs upon his life, and in a fit of passion he gave orders that Coligny should be killed and all the Huguenots with him. Catharine summoned a council, and St. Bartholomew's Day was appointed for the massacre. Coligny was enticed to Paris and murdered. His death was the signal for an orgy of slaughter. Prince Henry and the Prince of Condé only saved their liv
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a special medal, proclaiming a year of jubilee, and other ceremonies. *See* White's *Massacre of St. Bartholomew*, 1867, and Acton's essay in his *History of Freedom*, 1907.

Bartholomew, St., one of the twelve apostles, commonly identified with Nathanael, was born at Cana in Galilee, and introduced to Jesus by Philip. After the Crucifixion he is stated by various untrustworthy authorities to have preached in India, Armenia, and Asia Minor. According to tradition he was flayed alive and crucified at Albanopolis in Armenia, or Urbanopolis in Cilicia. His festival is celebrated on August 24.

Bartholomew, St., an is. of the West Indies, lying between St. Martin and St. Kitts (Christopher). It was first

settled by a colony of Frenchmen from St. Kitts in 1648. In 1689 it was taken by the English under Admiral Thornhill and remained in their possession until the peace of 1697, when it was restored to France. In 1746 it was again taken by the Eng. and was once more given up under the treaty of Aix-la-Chapelle. In 1785 the is. was ceded by France to Sweden, and continued subject to that power till 1878, when it was once more restored to France. The soil is fertile, producing sugar, cotton, tobacco, mandioca, cacao, and indigo. The is. is volcanic, and the shores are rocky and dangerous. Le Cerénage is a safe harbour, and near it is the capital, Gustavia. Area of is. 8 sq. m. Pop. about 3000.

Bartholomew Anglicus, *see* GLANVILLE, BARTHOLOMEW DE.

Bartholomew Fair was held annually in W. Smithfield, London, from 1133 till 1855 on St. Bartholomew's Day (Aug. 24, old style). It was at one time the chief cloth fair in the country, and an important market for cattle, pewter, and leather. A great feature of the fair was the large number of exhibitions, shows, performers of all descriptions, quack doctors, etc., which combined to make it one of the most widely popular affairs of its kind. After 1840 the exhibitions were held at Islington. It was proclaimed by the lord mayor for the last time in 1850 and abolished as a nuisance in 1855. *See* Morley's *Memoirs of Bartholomew Fair*, 1859.

Bartholomew's (St.) Hospital, Smithfield, London, was founded in 1123 by Rahere, a minstrel and favourite of Henry I., who was also prior and founder of the adjoining priory of the Augustinian Canons, in the church of which, St. Bartholomew the Great, his magnificent tomb is still to be seen. Within the grounds of the hospital is the anct. church of St. Bartholomew the Less. The priory and hospital were dissolved at the Reformation, but Henry VIII. refounded the latter in 1547. Rebuilt in 1730-66, it was extended in 1881 by the new buildings for the medical school, and from 1905 onwards by other considerable additions. Attached to it is a convalescent home at Swanley, Kent. The hospital contains paintings by Hogarth, Kneller, Reynolds, Lawrence, and Millais. Among the professors of the medical school have been Harvey, discoverer of the circulation of the blood, the anatomist Richard Owen, and the famous Abernethy.

Bartizan, a word apparently first used by Sir Walter Scott to describe a small, battlemented, overhanging turret projecting from the parapet, the angles at the top of a tower, or some other part of a building. It generally had loopholes for bowmen.

Bartlett, Sir Ellis Ashmead (1849-1902), a politician. He was born in Brooklyn, New York, and graduated at Christ Church, Oxford, in 1872. He became an inspector of schools. 1874-77; was called to the bar from the Inner Temple, 1877; an examiner in the educational dept. of the privy council office, 1877-80; M.P. for Eye, 1880-84; for Ecclesall Division, Sheffield, 1885-1902. He was chairman of the National Union of Conservative Associations, 1886-88. He became civil lord of the Admiralty in 1885, and was knighted in 1892. He was a strong anti-Russian, and an enthusiastic supporter of Turkey. He fought for the Sultan against Greece in 1897, and was taken prisoner by the enemy. He also went to the front in 1899 when the Boer war broke out. Author of *The Battlefields of Thessaly* (1897), and numerous political articles.

Bartlett, John Russel (1805-86), an American author and antiquarian. He began life as a banker at Providence, but removed to New York, where he was engaged as a foreign bookseller (1837-49); he was appointed on the commission to determine the boundary line between the U.S. and Mexico (1850-4); and was secretary of state for Rhode Is. from 1855 to 1872. He wrote *The Progress of Ethnology*, 1847; *A Dictionary of Americanisms*, 1850; *Literature of the Rebellion*, 1866; *Primeval Man*, 1868. His bibliographical works include *Records of the Colony of Rhode Island and the Providence Plantations* (10 vols. 1856-65) and *Bibliography of Rhode Island*, 1864.

Bartlett, William Henry (1809-54), an Eng. artist. He was *b.* in London, and was apprenticed as an architect, to John Britton. His sketches were almost entirely topographical. He provided the illustrations to Britton's *Cathedral Antiquities of England*, 1814-32; and illustrated *American Scenery*, 1840; and *Canadian Scenery* 1842, by N. P. Willis, after having travelled extensively in N. America. He is also the author of many works on Palestine and Egypt, which include, *Walks about Jerusalem*, 1844; *The Nile Boat: or Glimpses of Egypt*, 1849; and *Footsteps of Our Lord and His Apostles in Syria, Greece, and Italy*, 1851.

Bartoli, Adolfo (1833-94), an It. author. He was born at Fivizzano. He was associated in the editorial management of *Archivio storico Italiano*, 1856-59; director of the naval academies at Leghorn, Piacenza, and Venice; and professor of literary history in the Instituto di Studii Superiori of Florence. 1874-94. He

pub. a critical history of It. literature down to the 14th century, *Storia della Letteratura Italiana* (8 vols.), 1878-89; his other works include *I primi due secoli della letteratura Italiana*, 1870-79; *I viaggi di Marco Polo*, 1859; and *I precursori del Boccaccio*, 1876.

Bartoli, Danielle (1608–85), an It. Jesuit, born at Ferrara, and died at Rome. He entered the order of the Jesuits at the age of fifteen. He was commissioned by the father-general to write a history of the order, and it is for his *Istoria dell Compagnia di Gesù* that B. is chiefly remembered. Vols. i.-iii. deal with the history of the Jesuits in Asia, Japan, and China; a vol. on Italy appeared in 1673, and one on England in 1667. He was appointed rector of the Gregorian or Roman College in 1671. A complete edition of his numerous works appeared at Turin in 34 vols. (1823-44).

Bartoli, Pietro Santo (1635–1700), an It. painter and engraver, born at Perugia. As an engraver he obtained a great reputation, more however from the subjects and the number of his prints than for any particular excellence of execution. He studied painting under P. Le Maire and under Nicholas Poussin, from whom he probably, in some degree, derived his great love of the works of anct. art. As a painter he did very little beyond copying, in which he was so excellent that even Poussin himself had difficulty in distinguishing between his own pictures and the copies made of them by B. He had a correct appreciation of the merits of Gk. design, and though technically his prints have little excellence, they are in most cases true to their originals. His prints, mostly etchings, which amount to many hundreds, are chiefly from anct. bassi-rilievi or paintings in the ruins in or about Rome and other Italian cities.

Bartoli, Taddeo, or Taddeo di Bartolo (1363-1422), early It. painter, was *b.* at Siena. He was one of the greatest of artists in the period which preceded the Renaissance, and his chief care was expended on frescoes. Some of his best work, dating from 1414, is to be found in the municipal palace of Siena, and in the cathedrals of Pisa, Perugia, and Genoa. His favourite subject was the life of the Virgin, and one of his earliest works, 'The Virgin among the Saints,' 1390, is in the Louvre.

Bartolini, Lorenzo (1777–1850), a celebrated Italian sculptor, was a native of Vornio, near Florence. After acquiring considerable reputation as a modeller in alabaster, he went to Paris in 1797, where he studied painting under Desmarets and sculpture under Lemot. His bas-relief of 'Cléobis and Biton,' 1803, gained the second prize of the Academy. After the fall of Napoleon, who had been his great patron, he retired to Florence, where he died. Amongst his best works are: 'Charity,' 'Pyrrhus hurling Astyanax from the Walls of Troy,' 'Hercules and Lichas,' and 'Faith in God.'

Bartolommeo di Pagholo del Fattorino, Fra (1475–1517), also known as Baccio della Porta. One of the foremost Florentine painters of the Renaissance. He was born at Savignano, near Florence, by the gate of San Piero Gattolino, hence his name, 'della Porta.' He entered the studio of Cosimo Rosselli, where he came into contact with Piero di Cosimo and Albertinelli. He became a devoted follower of Savonarola, and on the reformer's death renounced his profession and in 1500 joined the Dominicans at San Marco. However, he continued to paint in his convent, and about 1504 painted the celebrated picture in the Florentine Academy, 'Apparition of the Virgin to Saint Bernard.' In 1506 Raphael on a visit to Florence made the acquaintance of B., and the two artists influenced each other's work in turn to a great degree. B. also learnt much from Leonardo da Vinci, and later from Michael Angelo. He was associated with his friend Albertivelli in many of his pictures; the fresco of the 'Last Judgment' (Santa Maria Nuova), 1498, was finished in the lower part by Albertinelli; and the 'Madonna and Saints' in the Pitti and the 'Assumption' in Berlin are among their joint productions. Some of his finest work is at Lucca, including the beautiful 'Madonna della Misericordia,' 1515; of his other well-known pictures, only a few can be mentioned. The 'Marriage of Saint Catharine' (in the Louvre), 'Saint Mark' (Pitti), and 'Saint Sebastian.' B. excelled particularly in draperies and in perfect symmetry of composition. He is said to have been the first to use the lay figure. Consult the biographies of Leader Scott, 1880; and Gruyer (Paris 1886); and Vasari's *Lives of Italian Painters*, 1895.

Bartolozzi, Francesco (1727–1815), a celebrated It. engraver, was a native of Florence. He was originally intended for his father's profession of silversmith, but his artistic bent led to his being instructed in painting. He subsequently studied engraving at Venice under Joseph Wagner. For a short time he lived in Rome, where he engraved a fine set of plates from the life of St. Vitus. In 1764 he settled in England under the patronage of George III. He was

one of the original members of the R.A., and executed for them, from Cipriani's design, the diploma, which is still used. In 1802, at the invitation of the Prince Regent of Portugal, he became superintendent of an engraving school at Lisbon, where he died. Amongst his best works are *The Silence* and *Clytie*, after Annibale Caracci, and *Venus, Cupid, and Satyr*, after L. Giordano. The famous actress, Madame Vestris, was his granddaughter. *See* Tuer's *Bartolozzi and his Works*, 2nd ed., 1885; and Baily's *Francesco Bartolozzi*, 1907.

Barton, Andrew, Scottish naval commander and the hero of a popular ballad, was killed in a fight with two English ships in 1511. Many of his operations savoured of piracy.

Barton, Benjamin Smith (1766-1815), an American naturalist and doctor. He was born at Lancaster, Pennsylvania, and studied medicine and the natural sciences in Philadelphia, Edinburgh, and London from 1782-88, and graduated at Göttingen. On his return to America he worked up a practice in Philadelphia, and in 1790 became professor of natural history and botany in the college there, and thus was the earliest teacher of natural science in N. America. He also held in succession the chairs of materia medica, 1796, and practice of medicine. In 1802 he was elect[illegible] American [illegible] in 1809 pr[illegible] Medical Society. His works include *Elements of Botany*, 1812-14; *Collections for an Essay toward a Materia Medica of the United States*, 3rd ed., 1810; and *Flora Virginica*, 1812.

Barton, Bernard (1784–1849), commonly known as the 'Quaker poet,' was born at Carlisle. For the greater part of his life he was a bank clerk at Woodbridge in Suffolk. He was the author of *Metrical Effusions*, 1812; *Poems by an Amateur*, 1818; and *Poems*, 1820. These works are mostly distinguished by piety and pathos. He was a friend of Charles Lamb, who gave him good advice on various occasions. *See* his *Letters and Poems*, 1849; new ed., 1860, with a memoir by Edward Fitzgerald.

Barton, Clara, American philanthropist, was *b.* at Oxford, Massachusetts, 1821. During the American Civil War she did relief work on battlefields and organised at her own expense the search for missing men. In the Franco-Ger. War of 1870, she associated herself with the International Red Cross of Geneva, since when she represented the U.S. at many international conferences, and in 1898 did personal field work at Cuba and in the Anglo-Boer War of 1899–1902. Her publications, besides her pamphlets and reports, include a *History of the Red Cross*, 1882: *History of the Red Cross in Peace and War*, 1898: *A Story of the Red Cross*, 1904; and *Story of my Childhood*, 1907.

Barton, Rt. Hon. Sir Edward, K.C., an Australian statesman. He was *b.* in 1849 at Glebe, near Sydney, New S. Wales, and was called to the bar in 1871. He was a leading figure in the legislative council and assembly, and was Speaker, 1883-87; Attorney-General, 1889-91; and Prime Minister, 1901-3, in the first Federal Parliament of Australia. In 1903 he retired and became Senior Puisne Judge o the Federal High Court.

Barton, Elizabeth, commonly called the 'holy maid of Kent,' was *b.* about the year 1506. She served at an inn at Aldington. After a severe illness in 1525 she became subject to hysterical ravings and fell into a state of religious mania. Archbishop Warham sent two monks to examine her, and one of these, Edward Bocking, or Bockling, was quick to see that she might be used as an instrument for reviving popular belief in the Catholic Church. He instructed her in the fundamental points at issue between his church and Protestantism, and in the legends of the saints, and personally directed her prophesyings to his own ends. In 1527 she became a nun at the priory of St. Sepulchre at Canterbury. In 1532 she opposed Henry VIII.'s intention to divorce Catherine and predicted his death within seven months of his marriage with Anne Boleyn. The non-fulfilment of this prophecy brought about a loss of popular confidence; she was arrested and confessed that 'all that she ever said was feigned of her own imagination only, to satisfy the minds of those which resorted to her and to obtain worldly praise.' In 1534 she was executed at Tyburn, with Bocking and other accomplices, on a charge of high treason. *See* Burnet's *History of the Reformation in England*, 1737.

Barton, Sir Geoffrey (*b.* 1844), a British soldier. He entered the army in 1862; he served with great distinction in the Ashanti War, 1873-4, and was promoted to the rank of captain; took part in the Zulu War, 1879; he went to Egypt (1882) with an expeditionary force, and was present at Kassassin and Tel-el-Kebir; he acted as assistant military secretary to China, 1884-5; and was again called to the front during the Boer War (1899-1902), when he commanded a Fusilier brigade. He was wounded at Ladysmith and commanded the Krugersdorp dist. till 1902. He was

created C.B. in 1889, C.M.G. in 1900, and knighted in 1906.

Barton Clay, a name given to some beds of the Eocene strata which are well exposed in the cliffs of B. in Hampshire. They contain a great variety of fossils of creatures which were of sea origin.

Barton-on-Irwell, a tn. near Manchester, in the Eccles div. of Lancashire. It is noted for its peculiar movable bridge across the Manchester Ship Canal, erected in 1893. Pop. 36,000.

Barton-upon-Humber, an ancient mrkt. tn. on the S. side of the Humber. At the time of the Norman Conquest it was one of the prin. ports of the Humber. The town contains two large churches, one of which is very old. There is considerable trade in corn, and bricks, tiles, ropes, sacking, sailcloth, and pottery are manufactured. Tanning is also carried on. Pop. (1901) 5671.

Bartsch, Adam von (1757-1821), was *b.* and *d.* at Vienna. He was educated in the school of engraving at Vienna, under Professor Schmützer. In 1781 he was appointed keeper of the prints of the royal collection, which led eventually to the publication of his well-known work, *Le Peintre-Graveur* in 21 vols. 8vo., 1803 21, which is a description of the greater part of the works of the prin. engravers of Europe, and to which he now chiefly owes his reputation. His etchings also are numerous.

Bartsch, Karl Friedrich Adolf Konrad (1832-88), a German scholar. He was born at Sprottau, Silesia; professor of Germanic and Romance philology at Rostock (1858-71), and at Heidelberg (1871-88). He edited numerous texts of Middle High Ger. and Provençal poetry, and pub. *Untersuchungen über das Nibelungenlied* in 1865, which he translated into modern Ger. two years later. He also translated the poems of Burns (1865) and Dante's *Commedia* (1867), while in 1874 he pub. a volume of original lyrics. He also wrote critical works on the early literature and language of Germany and France.

Bartsia, a genus of plants, chiefly herbaceous and semi-parasitic, belonging to the Scrophulariaceæ which grow in a N. temp., in tropical mts., and S. America. There are three British species, of which *B. alpina* and *B. odontites* are two. *B. maxima*, a native of Candia, grows to a height of 1½ or 2 ft.; *B. acuminata* is found in America, *B. trixago* in S. Europe and Asia.

Barttelot, Major Edmund Musgrave (1859-88), a distinguished officer of the British army. He served in India, Afghanistan, and Egypt: joined the Stanley expedition for the relief of Emin Pasha (1887), and was murdered by one of his followers on a journey into the interior. Stanley brought a charge of cruelty against him, which was refuted by his brother, Major Walter G. B. B. in *The Life of Edmund Musgrave Barttelot* (London, 1890).

Baru, a fluffy substance obtained from the sago palm *Saguerus saccharifei.* used for stuffing cushions and for calking boats.

Baruch (Heb., blessed), the son of Neriah, the son of Maaseiah, to whom Jeremiah dictated his prophesies, and who read the roll before the princes in the reign of Jehoiakim, about 606 B.C. During the siege of Jerusalem by Nebuchadnezzar, B. and his master were at first imprisoned, but were afterwards released and allowed to choose their place of residence; they afterwards went into exile in Egypt, *c.* 588 B.C. There is diversity of opinion concerning the close of his life. According to Josephus (*Antiq.* X. ix. 7) he went from Egypt to Babylon: but another asserts that he died in Egypt. *See* Jeremiah xxxii., xxxvi., xliii., xlv., and li., and Cheyne's *Jeremiah: His Life and Times*, 1888.

Barvas, a parish of Lewis Is., Hebrides, Ross-shire, Scotland. Pop. about 700.

Barwick, John (1612-64), an Eng. divine. He graduated at St. John's College, Cambridge, in 1635, and became M.A. in 1638. His loyalty to the Royalist cause obliged him to leave Cambridge; he communicated the designs of the rebels to Charles I., was charged with high treason and imprisoned in the Tower, 1650-2. At the Restoration, he became dean of Durham, 1660, and dean of St. Paul's, 1661.

Barwood, *see* CASTWOOD.

Barye, Antoine Louis (1796-1875), Fr. sculptor, was born in Paris, and studied sculpture under Bosio and painting under Gros. He is famous for his marvellous animal studies, which were the starting-point of a new type of art. Amongst these are the 'Lion Struggling with a Snake,' 'Lion Resting,' 'Theseus and the Minotaur,' 'Lapitha and Centaur,' and 'The Hunt of the Wild Ox.' There are sev. examples of his work in the Gardens of the Tuileries. He was also successful with the human figure, as exhibited in his four groups, 'War,' 'Peace,' 'Strength,' 'Order.' He worked largely in bronze. *See* Alexander's *A. L. Barye*, 1889; and Ballu's *L'Œuvre de Barye*, 1890.

Baryta, *Barium monoxide* (BaO), an earth occurring in the minerals barytes, or heavy-spar, and witherite.

The original name was *barote* (from *βαρύς*, heavy), but Lavoisier's alteration to B. has been universally adopted. It was at first thought to be an elementary substance, but prolonged investigation led to its being separated into the metal *barium* (*q.v.*), and oxygen. B. is formed when barium burns in air, or by heating barium nitrate until no more red fumes are given off. It may also be prepared by heating witherite mixed with charcoal to a white heat. It is a greyish-white solid, with sp. gr. about 5; it melts at 2000°. When heated with air barium peroxide (BaO_2) is formed. *Baryta-water* is a solution of barium hydroxide in water. It is used as an absorbent for carbon dioxide.

Barytes, heavy-spar, or barium sulphate, a mineral, important as the chief source of soluble barium compounds, and as a pigment under the name of 'permanent white.' It derives its name from its high sp. gr. (4·5) as compared with other mineral sulphates or other minerals with the same general appearance. It occurs in rhombic crystals of varied forms, and may be artificially produced by acting upon baryta with fuming sulphuric acid. The natural sulphate is commonly found associated with lead and silver ores, and is prepared for use as a paint by being finely ground, usually along with white-lead, treated with sulphuric acid to remove iron salts, washed, and dried.

Baryton, also called **Viola di Bardone**, a stringed musical instrument resembling in tone the viola da gamba. It was invented in 1700, and has now fallen into disuse. Haydn composed a large number of works for this instrument.

Barytostrontianite, *see* STRONTIUM.

Bas, or **Batz**, an is. in the Eng. Channel, off the N. coast of the dept. of Finisterre, France. It is about 2½ *m.* long and 2 *m.* broad. The is. has three vils., a fine lighthouse erected on a hill 223 ft. above the sea level, two forts, and a haven, that of Kernoc. The chief occupation of the men is fishing, while the women cultivate the soil. Pop. about 1200.

Bas, or Bas-en-Basset, a town of France in the dept. of Haute Loire, arron. Yssingeaux, on the l. b. of the Loire, 17 m. S.W. of St. Etienne. There are mineral springs; corn and the vine are grown, and there are manufs. of pottery, ribbons, and lace. Pop. about 2000.

Basaiti, Marco, one of the best of the early *It.* painters, was born in the Friuli, probably about the middle of the 15th century. He lived chiefly in Venice, where he was the rival of Gian Bellini, to whom he was even superior in some respects, especially in composition, in accessory groups, and in the management of the landscape or scene. He was perhaps inferior to Bellini in modelling the features, but he was quite equal to him in expre[illegible]
not his super
Some of B.'s
most brillian
gard to colou[illegible]
his works in Venice. His masterpiece is the 'Calling of St. Peter and St. Andrew,' in the Academy of Venice, formerly in the old church *della* Certosa. There is a beautiful 'Descent from the Cross,' by B., in the Gallery of Munich.

Basalt, a widely-distributed igneous rock. The Lat. *basaltes* is derived from an African word meaning 'a stone containing iron,' and many varieties of the rock contain iron in the form of magnetite. Igneous rocks are broadly divided into [illegible]
large amount
and basic roc
quartz is absent, and a comparatively large amount of iron and magnesia is present. The most abundant member of the latter group is B., which consists chiefly of plagioclase felspar, augite, and olivine. Under the microscope the minerals augite and olivine appear embedded in a crystalline ground mass of plagioclase felspar, augite, and magnetite. In older rocks the olivine is frequently altered in part to a fibrous green serpentine. B. rocks are of common occurrence in Iceland, Skye, Mull, Antrim, Central France, Germany, Italy, Washington, Idaho, the Deccan, Sandwich Islands, etc. They represent lava which has exuded from fissures in the ground, and has spread over a considerable surface. The stresses to which the cooled rocks were subjected resulted in a network of cracks or 'joints' of a roughly hexagonal shape, similar to the cracks produced in dry mud under certain circumstances. Hence many of the basaltic rocks of Northern Ireland and Western Scotland exhibit a columnar structure, as in the Giant's Causeway and Fingal's Cave. B. was known to the ancient Egyptians and Romans, who used it for building purposes. In Rome it was introduced in the 1st century B.C., the black, green, and brown varieties having been identified. The basaltic plateau of Auvergne played an important part in the controversy between the 'Vulcanists' and 'Neptunists' of the latter part of the 18th century. The 'Neptunists,' led by Werner, held that igneous rocks were produced by chemical precipitation from the ocean which covered the surface of the earth at one time. In 1752 Guet-

tard, by a careful study of the B. rocks of Auvergne, showed that they were true lavas, not necessarily ejected from cone-and-crater volcanoes, but gradually extruded from fissures in the earth's crust and extending themselves in all directions.

Baschi, an It. tn., in Umbria, on the Tiber. It is 29 m. N.N.W. of Perugia. Pop. 5000.

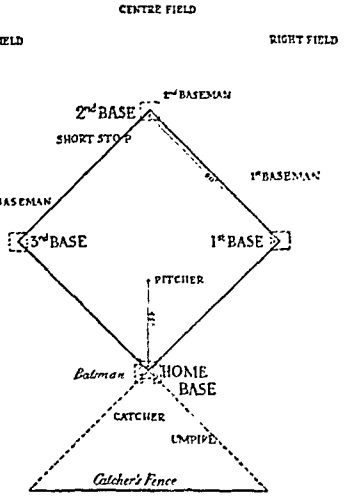
Bascinet, Basinet, or Basnet, was a light helmet, so called from its resembla[illegible] out a v visor Bs. were worn in the reigns of Edward II., Edward III., and Richard II. by most of the English infantry.

Base (Gk. *βάσις*), a foundation or starting-point. In geometry, the line or surface upon which a figure or solid stands. In games, such as baseball and prisoner's B., the station to or from which the player proceeds. In heraldry, the lower portion of a shield, often cut off from the remainder by a horizontal line. Any figure which is placed in this lower part is said to be 'in B.,' and if it does not occupy the central portion it must be distinguished as being in the dexter or sinister B. point. In architecture, the lowest member of a column upon which the shaft rests. In the military art, a secure position where the main supplies and reserve forces are kept, which is connected with the attacking forces by defended 'lines of communication.' In chemistry, a B. is a substance which is capable of combining with an acid to form a salt. In inorganic chemistry, Bs. are usually oxides and hydroxides of metals. The term is most often applied to the oxides of the alkali metals and the alkaline earths which combine readily with water, forming hydroxides. A distinguishing feature is the power of turning red litmus blue. In organic chemistry, many substances exist, such as the alkyl compounds and the ammonia derivatives, which are capable of combining with acids to form organic salts.

Base, in music, *see* BASS.

Base, or Bass, or Base Viol is a name sometimes given to the violoncello, an old stringed instrument with five or six strings.

Baseball is the national game of the U.S.A., such as cricket is in England. It was founded on the old Eng. game of rounders, to which it is still very similar, but has now been reduced to a science and skill quite unknown in the former pastime. It is a game of comparatively modern origin, and one of the first mentions of it in literature is in Jane Austen's *Northanger Abbey*, pub. in 1818. The first club was formed at New York in 1845, and known as the Knickerbocker Club, and in 1865 another club, the Excelsior, was formed at Boston. For five years or so the game did not 'catch on' with the public very extensively, but after 1865 its popularity increased by leaps and bounds, and to-day its followers number millions of all grades of society. Recently, in New York, 250,000 people tried to get into a ground which only held 40,000, and working men are known to have paid as much as £5 for a ticket costing originally 8*s*. This was for the famous game between the New York Giants and the Boston Red Sox, to decide the world's championship (won in 1912 by the latter club). But to go



BASEBALL

back to some earlier history of the game, the first professional club was formed at New York in 1871, and five years later the National League of Professional Baseball Clubs was formed, which to-day, working with the American Baseball Association, holds a position equivalent to our M.C.C. in the cricket world. The game is played by nine players on each side. The bat is round, and must not exceed 42 in. in length and 2½ in. in diameter at the thickest part. The ball weighs about 5 ozs. and is about 9 in. in circumference. The ground is in the form of a diamond, 90 ft. square. Bases are placed on each angle, and are known as home, first, second, and third bases. The ball is delivered with great swiftness by the pitcher, who stands in the centre of the diamond to the batsman, who stands by the

home base. The catcher is behind the latter, while the fieldsmen take up positions as first, second, and third basemen, the short stop, centre fielder, right fielder, and left fielder. The batsman must, after hitting the ball *fairly*, attempt to make the circuit of the bases, at the angles of the diamond. If he succeeds he scores a run. He may stop at any base and try and steal on to the next while another batsman plays, but if he is touched by the ball away from the base he is out. He must always move on to make room for another base-runner. A batsman may be put out by failing to hit the ball after three attempts, in which case he is said to be 'out on strike,' and by being caught out by any of the fielders. Nine innings make up a game, unless the score stands at a tie at the ninth innings, in which case the game is continued till one or other of the teams is ahead at an even number of innings. An innings is closed when three men are out, and it is not necessary to wait until the whole side are out. This not only equalises the chances of both teams at batting, but of all the members of each team. In an ordinary game each player has from five to six chances at batting and to make runs, so that if he fails at the first attempt he has still other chances. The enjoyment of the players is not centred in the batting, for the fielding is so diversified and presents so many opportunities of distinction, that many players enjoy it quite as much as the batting. Upon the celerity and accuracy of the fielders' movements the whole game may turn. Then in the pitching there is great art and skill required, to get curves, twists, and shoots on the ball. To such perfection has pitching and fielding been carried that in many professional games the score is rarely taken into double figures. At present the game is played very little in England, although one or two clubs have been formed. For those who want to read all the rules of B., Messrs. Spaldings of Holborn, London, publish a very useful handbook which contains these and other interesting points on the game.

Base-Clef, *see* CLEF.

Base, Continued, *see* CONTINUED BASE.

Base, Double, *see* DOUBLE BASS.

Base-Fee, *see* ESTATE; RECOVERY; TENANT-IN-TAIL.

Base-Figured, *see* FIGURED BASE.

Base, Fundamental, *see* FUNDAMENTAL BASE.

Base, Ground, *see* GROUND BASE.

Base-line, in surveying, is a measured line which forms the side of a triangle, and of which the adjacent angles are also measured, so that the third point of the figure is easily determined. The country to be surveyed being thus mapped out in triangles, the details can be filled in without overlapping. In large surveys many B. are drawn, varying in length from three to ten miles.

Base of Operations is the term used in warfare for the depôt where everything required for the fighting army—recruits, horses, food, and ammunition—is collected and organised before being sent to the front, and where the wounded can be attended until recovered or transported to their homes. The B. of O. is usually a seaport or the bank of a river, bu tin inland warfare may be a mountain-range or stretch of plain. the only essentials are that the base should command a line of open communications between the army and the mother-country. An army cut off from its B. of O. and a base cut off from its source of supplies are both useless. In the Franco-Prussian War of 1870 the Prussian B. of O., for instance, was the chain of fortresses which line the banks of the Rhine, and in the Boer War, 1899-1902, the British base was Cape Town.

Base, Thorough, *see* THOROUGH BASE.

Basedow, Johann Bernhard, originally **Johann Berend Bassedau** (1723-1790), Ger. educational reformer, was born at Hamburg and died at Magdeburg. In 1753 he taught at Sorõe, in Denmark, and in 1760 in a school at Altona, which he was obliged to leave in the following year because of his heterodoxy. In 1762 Rousseau's *Emile* gained in him a strong admirer, and increased his desire to instruct youth according to nature in all things. In 1774 he pub. his *Elementarwerk*, an extension of Comenius's *Orbus Pictus* infused with the theories of Rousseau; it was an illustrated schoolbook, pub. by contributions from influential and wealthy people. In the same year he opened his Philanthropin at Dessau to carry his theories into practice, but after ten years he found himself unable to cope with it, owing to his restless and quarrelsome disposition. He then devoted himself to private tutoring, and the Philanthropin was closed three years after his death. He is noteworthy as the forerunner of Froebel and Pestalozzi, and his work as a reformer has had great influence on education throughout Europe.

Basel, or **Bâle,** sometimes incorrectly written **Basle,** a rich city of Switzerland and cap. of the half-canton of *Bâle Ville*. The opening of the St. Gotthard Tunnel Railway in 1882 has largely been the cause of the growth of the city. Merchandise

from all parts of Central Europe is stored in B. before its redistribution by means of the St. Gotthard line. Although B. is supposed to be the wealthiest city of the Swiss Confederation, yet the city has a very dirty appearance. The town was founded in A.D. 374 by the Emperor Valentinian. In the 5th century the Bishop of Augusta Rauricorum moved his see thither. From that time the history of B. is that of the increasing power of the bishops in matters spiritual and temporal. In the 14th century the secular influence of the bishops was destroyed by the burghers. An earthquake almost destroyed the city in 1356, and later in the century more than half the pop. was destroyed by the 'Black Death,' sometimes known as the 'death of B.' on account of the ravages in that particular city. The city was admitted into the Swiss Confederation in 1501. Later it became one of the chief centres of the Reformation movement. Many Lutheran books were pub. here. In 1832 the rural dists. declared their independence as the city was in the hands of the trades guilds. It was then divided into two independent half-cantons in 1833, known as B. Stadt and B. Ville. The canton of B. borders on Alsace-Lorraine and Baden and has an area of 777 sq. m. It lies on the northern slope of the Juras. The chief rivs. are the Rhine and its tribs., Birz and Egloz. The Rhine divides the city into two parts, known as the Great and Little B. There are many bridges over the Rhine. The inhab. are chiefly engaged in agriculture, fishing, manuf. of ribbons, woollens, and leather. A university was founded in 1460. Pop. (1901) 111,009.

Basel, Council of. A decree issued by the council of Constance and sanctioned by Pope Martin IV. had obliged the papacy periodically to summon councils. Under Pope Martin and succeeding popes the councils adopted different methods of procedure from those hitherto used. Instead of methods followed by Constance, where the members deliberated and voted by nations, the council was divided into four depts., each with its own organisation, each investigating a particular class of subjects, its decision being communicated to the others. If three divs. agreed in their opinions the matter was brought before the whole council for final discussion and judgment. Attempts were made by the C. of B. to conciliate the Hussites, but the pope not only refused to sanction the movement, but ordered the council to be dissolved. This order was disregarded, as was also the order that the council should remove to Italy. The council also ratified the right of the general council to exercise authority over the pope. It concluded a peace with the Hussites known as the Treaty of Prague, 1433. Finally, Eugenius IV. ratified all the decrees by a bull issued in 1433. On another prospect to unite the distressed Gks. with the church of Rome the B. fathers refused to meet at Farrara. The pope failed to appear, and the council then issued a decree suspending him from office. He was formally deposed, and in 1439 Duke Amadeus of Savoy was elected in his place. On the death of Eugenius a compromise was effected by which the fathers directed the church to obey the new Pope Nicholas V. Thus ended the last attempt to reform the church from within.

Basement, in architecture, is the lowest story of a building. Mediæval and Renaissance palaces were built with Bs., which possessed a more massive, but plainer exterior than the rest of the building. In modern dwelling houses, the B. usually contains the porter's lodge, store-rooms, offices, servants' quarters, etc.

Basey, a tn. of the Philippine Is. It is on the San Juanico Strait, Samar Is. Pop. 14,000.

Basha, *see* PASHA.

Bashahr, one of the trib. hill-states of the Punjab, on the lower slopes of the Himalayas; pop. 84,500.

Bashan is called by the Septuagint Βασάν, by Josephus and Ptolemy Βαταναία (Batanæa). B. belonged to Gilead in the widest sense, but in a stricter sense it was distinguished from and situated to the N. of Gilead. B. bordered in the N. upon the Syrian dists. Geshuri and Maachathi; in the S. it did not reach to the R. Jabbok. Its western boundary was the Jordan. The eastern limits are undefined.

B. was a kingdom under Amoritish sovereigns who resided in Ashtaroth and in Edrei. Og was the last king of the Amoritish dynasty. In the battle of Edrei, about the year 1452 B.C., the Israelites smote Og, with his sons, and all his people, until there was none left alive; and they possessed his land. Moses gave B. unto the half tribe of Manasseh, 1451 B.C. At the commencement of the Christian era B. belonged to the tetrarchia of Philippus, and afterwards to the tetrarchia of Agrippa II. *See* Holy Scriptures; Josephus, *Antiquities of the Jews.*

Bashee Islands, a cluster of small is. situated between the Is. of Luzon and Formosa, and producing sugar-canes, plantains, and yams.

Bashibazouks are irregular Turkish troops serving under the sultan and receiving their reward chiefly from plunder. They are strong and violent, and were greatly responsible for the Bulgarian atrocities of 1876.

Bashkirs, people who inhabit both slopes of the Ural Mts. from about 54° to about 56° N. lat. They are Mohammedan in religion, partly nomadic, and number about 750,000.

Bashkirtseff, Marie (1860–84), Russian painter and diarist, was *b.* of

intense and passionate desire for immortal fame. She was endowed with a beautiful voice and considerable literary gifts, but chose painting as her final expression in the arts, and her picture of 'The Meeting,' 1884, may be seen now in the Luxembourg. She travelled much in Rome, Nice, Paris, and other Continental towns, establishing for herself a reputation as a woman of society and culture, but when only twenty-four she succumbed to hereditary consumption. The *Journal de M. B.* appeared in Paris in 1887, and the *Lettres de M. B.* in 1891.

Basi, a tn. of the Punjab, India, 140 m. S.E. of Lahore; pop. 14,000.

Basidu, Basidoh, or Bassadore, a port of Persia on Kishm Is., which is a British possession.

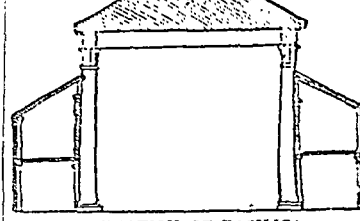
Basil, a name applied to several species of Labiatæ. The sweet B., *Ocimum basilicum*, grows in India and is cultivated as a pot-herb; *Calamintha arvensis* is the common B., and *C. Clinopodium* the wild B. The B. famed in romance and art is the *Ocimum basilicum; it is immortalised in Boccaccio's Decameron*, in Keat's poem, and Holman Hunt's painting of 'Isabella and the Pot of Basil.'

Basil, or Basilius (Βασίλειος) (326-379 A.D.), commonly called St. B., and on account of his learning and piety surnamed the Great; born at Cæsarea, studied at Antioch and Constantinople. Libanius was his master, or more probably his fellow student. He went to Athens, where he met Gregory of Nazianzus; returned to Cappadocia, 355, and taught rhetoric; travelled in Syria, Egypt, and Libya, visiting the monasteries; he was so pleased with the lives of the monks that he determined to found a monastery in Pontus. At the death of Eusebius, 370, he was chosen bishop of Cæsarea; he refused to embrace the doctrine of the Arians, and in consequence was much persecuted by the Emperor Valens. His works were issued in Greek by Frobenius at Bâle, 1532, with a preface by Erasmus. *See* Cave's *History of the Father of the Church*; Guidas, *Basileius of Cæsarea*.

Basil, Monks of St. St. Basil, about the year 358, when he retired to Pontus, founded a monastery for himself and his followers, and drew up its regulations, which were soon adopted in other monasteries. All who followed it styled themselves of the order of St. Basil, and St. Basil's Rule was the parent of that one afterwards framed by St. Benedict. In 1057 the order was introduced in the W. In Spain the monks of St. Basil follow the Gk. *ritual, and in Italy the Lat.*; there are or were many in Russia. The order is never known to have existed in England.

Basilan Is., the largest is. on the Sula Archipelago, separated from Mindano Is. by the Strait of B. The cap. is Isabela, and the pop. about 8000.

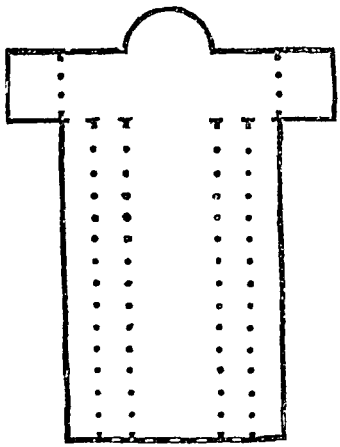
Basilica, from the Gk. βασιλική, lit. signifies a royal residence. The Romans gave the name of Basilicæ to those public buildings with spacious halls, often surrounded with wide porticoes, and used for the administration of justice, and for business purposes. The first one built in Rome was the B. Porcia, 184 B.C., and they continued to be erected until the beginning of the 4th century A.D.



ELEVATION OF BASILICA

The B. consisted of a large roofed building, supported on columns. The roof rose high above the other part of the structure, which consisted of two galleries, called porticus, placed one above the other, and round the internal sides of the central building. The porticus was covered with a lean-to roof. At the end of the central part of the interior a raised platform formed the tribunal for a magistrate. The central space corresponded to what we call the nave of a church, and the porticoes to the aisles. It is probable that Rome possessed Basilicæ in all the different

fora of the city. The B. Ulpia formed a part of the Forum Trajanum, and a B., of the Corinthian order, was discovered on the Palatine Hill. The Temple of Peace in the forum has been called the B. of Constantine. It is in Pompeii, however, that the most



PLAN OF BASILICA

perfect B. of antiquity exists. Many of the early Christian churches of Rome were built in the style of the Basilicæ. Modern Basilicæ are still found in It. towns, and are used for civil purposes.

Basilica (Βασιλικά, Βασιλικὸς νόμος), a Greek code, which was commenced *c.* A.D. 876 by the Emperor Basilius I., and completed by his son Leo VI. the philosopher, and pub. in sixty books, in 887. It was revised by the order of Constantine VII., about A.D. 945.

The B. comprised the *Institutes*, the *Digest* or *Pandect*, *Code*, *Novellæ*, and the *Imperial Constitutions* made after the time of Justinian, in sixty books, which are subdivided into titles. The extracts from the *Digest* are placed first under each title, then the constitutions of the *Code*, and next the extract from the *Institutes* and the *Novellæ*. The B. does not contain all that the *Corpus Juris* contains, but it contains some things which are not in the *Corpus Juris*. An edition of the larger part of the B., by Fabrot, was pub. at Paris in 1647, 7 vols. fol. Another edition is that of Heimbach, 1833-50.

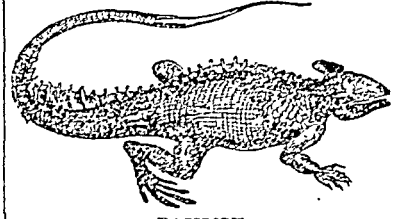
Basilicata, a part of Italy which exactly covers the modern prov. of Potenza, and was one of the original sixteen compartimenti of the It. kingdom. It forms part of anct. Lucania on the Gulf of Tarentum, and its chief n. is Potenza. Pop. 500,000.

Basilicon (Gk. βασιλικὸν, royal), a name sometimes applied to sev. resin ointments, consisting of yellow wax with lard and rosin, or of Burgundy pitch, suet, and turpentine. It is usually known as *Ceratum resinæ*, or resin cerate.

Basilicon Doron (Gk., royal gift) is the title of a book written by James VI. of Scotland in 1599 for his son, Prince Henry. In it he expounds his theory of the divine right of kings.

Basilides (*fl.* A.D. 125), the founder of a Gnostic sect, lived in Alexandria under the Emperors Trajan and Hadrian. In his doctrines he somewhat reflected Zoroaster, but his tendency towards asceticism was discarded by his later followers. He taught the doctrine of emanation, beginning with the emanation of mind from Abraxas, the Supreme Power, down to the creation of 365 worlds by a number of angelic powers. There were 365 emanations, a mystic number constantly occurring in this religion; the name Abraxas itself being a corruption of Abrasax, a Gk. word of which the letters are computed to make the number 365. Little is known of the life of B., who died *c.* A.D. 130.

Basilisk among the Gks. and Roms. was believed to be a creature possessing many extraordinary attributes, such as the power of killing by means of its deadly glance and burning, poisonous breath. The name has been



BASILISK

given by zoologists to a genus of tree-lizards of the family Iguanidæ, which are perfectly harmless. They are to be found in Central America, where they are considered to be edible. *Basiliscus mitratus* is the most common species, and is noted for its scaly helmet.

Basilius I., the Macedonian (*d.* 886), Emperor of Constantinople; at the age of twenty-five became a favourite of the Emperor Michael III., who made him his colleague. B. murdered him, and was proclaimed emperor. He ruled wisely, and began to compile the code of laws completed by his son Leo; he dismissed Photius (*q.v.*) and re-established the patriarch Ignatius; fought with the Saracens;

helped to convert the Russians, but always was quarrelling with the Rom. church; *left a book of advice* (Κεφάλαια Παραινετικὰ) to his son Leo.

Basilius II. (*d.* 1025), son of Emperor Romanus the Younger, at whose death the crown was usurped by Phocas, who, six years after, was killed by John Zimisces; the latter took the crown, but acknowledged as his successors B. and his younger brother, Constantine. In 975 they were proclaimed emperors under their [illegible] ed with [illegible] onians, Longobard Dukes of Benevento. In 1014 B. defeated Samuel, King of the Bulgarians. Vladimir, Grand Duke of the Russians, married B.'s sister and received the baptism, 988, abolishing paganism. B. was succeeded by his brother Constantine as sole emperor.

Basilosauros, the generic title proposed by Dr. Harlan for a fossil animal found in the Eocene of N. America, New Zealand, Europe, and Egypt. It is a mammal of the order Cetacea, and is allied to the dolphins and porpoises. Professor Owen has given it the accepted generic name of *Zeuglodon*.

Basin is a term used in geography to indicate the whole tract of country drained by a certain river.

Basin, in geology, is a name applied to depressions of the strata occasioned by synclinal dips, especially such as are on a large scale. The tertiary Bs. of London, Hampshire, and Paris, rest on chalk, and the coal-basin of S. Wales rests on old red sandstone.

Basing, John, or **de Basingstoke** (*d.* 1252), a remarkable scholar, who received his name from the place of his birth. He studied at Oxford, Paris, and Athens; he brought home with him several Gk. manuscripts, and was promoted by Grosseteste to be archdeacon of Leicester. He introduced what was thought (by Mathew of Paris, who writes of him) to be Gk. numerals, but which were neither Greek nor Arabic.

Basingstoke, a market tn., a parliamentary and municipal borough of Hampshire. It is the terminus of the London and Hants Canal. It has manufs. of agricultural implements, clothing factories, etc. The remains of the castle destroyed by Cromwell in 1645 may be seen, and traces of Rom. occupation have been found. Area of parish 4172 acres. Pop. 10,500.

Baskerville, John (1706–75), an Eng. printer, *b.* at Wolverley in Worcestershire. He kept a writing school in Birmingham, and in 1745 entered the japanning business. He improved printing in respect to the shape of letters (hitherto the matrices had been imported from Holland). His business, however, was of little profit to him. He died without issue.

Basket is a vessel made of willow-twigs, rushes, cane, or other materials, [illegible] is obscure, the connection with the Lat. 'bascanda' being now discredited. In older times other things than Bs. were made in B.-work, the shields, huts, and boats of the early settlers in Europe being of osier-work, plastered with clay. From the earliest times down to the middle of the 19th century no considerable changes in B.-work have taken place, as an old hamper excavated near Lewes was manufactured by the same methods as now. In the latter half of the 19th century, however, the character of B.-work was greatly changed, cheap goods made in Europe driving out the old small domestic wares, whilst in the higher classes chairs, tables, etc., were produced of considerable beauty and utility. Of late years the Eng. B. trade has been somewhat better; the Basketmakers' Company, which still exists, is one of the oldest craft guilds of the city of London. Vegetable and fruit Bs., and protective wicker cases for fragile goods, are the prin. articles made in B.-work. No machinery is used in the making of Bs., and consequently a certain amount of natural aptitude, as well as considerable training, are required to make an expert workman. The wages of a B.-maker are from twenty-five to fifty shillings a week, according to ability.

Certain species of willow are the most largely used materials for B.-making. Large quantities are grown in Europe, and exported to Great Britain and the United States, but no rods surpass in suitability those of England. The finest specimens are grown in Leicestershire and Nottinghamshire, and the valleys of the Thames and Trent. In the early years of the 19th century the English industry was given an impetus by a premium offered by the Society of Arts. The most extensive Eng. willow plantation is at Thurmaston, near Leicester, and is 100 ac. in area. Sev. continental varieties have been introduced into this plantation, with considerable success.

Willows are divided into 'osier' and 'fine' varieties. They are sorted into various sizes, and soaked in tanks to render them pliable, with the exception of the 'uprights,' for periods varying with the size of the rods from half an hour to a week. The 'brown stuff,' or unpeeled rods, are used for the coarser work, whilst the 'white

stuff' and the 'buff,' which is boiled before peeling, are used for the more delicate work. When necessary the rods are divided into 'skains' of different sizes by a 'cleaver,' a wedge-shaped tool, then by a kind of spoke-shave, and trimmed off by a flat piece of steel with a cutting edge at each end. Other tools used by a B.-maker are a shop knife; a picking-knife, to trim off the ends; 'bodkins,' flat triangular pieces of iron; shears, and a 'dog' for straightening the sticks. The employer supplies a screw-block, or a vice, and a lapboard. These comprise all the tools used, but a common round B. can be made with no other tools than a bodkin and a shop knife. In making a B. the bottom sticks are first woven together, forming the 'slath,' or foundation of the B. The uprights, stouter rods than the 'woof' of the B., are then fixed into the 'slath,' and the other rods woven in and out between them till the required height is reached. The ends which then project are turned down alternately inside and outside the B., thus fastening and completing it. A lid is then made in the same way as the bottom of the B., and is fastened on by pieces of twine or a hinge formed by rods.

Other materials used in making Bs. are cane (*calamus viminates*), whole or made into 'skains,' whilst the central pith of the cane is largely used in Great Britain and Europe in the manuf. of wickerwork furniture. From splints of various species of bamboo the Chinese and Japanese manuf. Bs. which are marvellous in beauty and delicacy of finish. Bs. are also made from the fronds of the Palmyra palm, and an extensive establishment is engaged in that industry in the Black Forest. In Spain and Algeria fruit Bs. are made from esparto fibre, in the Seychelles from the fronds of palms, and in other places, Khus-Khus grass, straw, and various species of pine are used.

The chief centres of the industry in England are London, Thurmaston, Basford, near Nottingham, and Grantham. The Verdun dist. in France; Belgium; Sonnefeld, Saxony, and Lichtenfels in Germany; Bavaria, the Black Forest, and Japan all produce large quantities of Bs. and B.-work. The chief importers into this country are Japan and France, and an increase in the quantity of Japanese goods imported of late years has been counterbalanced by a large decrease in imports from France.

Basket Ball, a game played by opposing teams of five with an inflated ball, resembling a football. It may be played in the open-air or on a covered floor in a space not exceeding 3500 sq. ft. At each end of this oblong space is fixed a pole, 10 ft. in height, to which is suspended from metal rings, 18 in. in diameter, a 'basket' or net bag. The object of each team is to throw the ball into the enemy's 'basket,' or goal, and to guard their own goal from the opposing team. The ball, which is an inflated bladder covered with leather, about 30 in. in circumference and 20 oz. in weight, must be played with the hands and may not be kicked. Any kicking, or intentional rough play, such as tackling or shouldering, is regarded as a foul; the penalty for which is a free throw to the opposing team, from a distance of not less than 15 ft. from the basket. The game was invented in 1891 at a sitting by James Naismith, of the Young Men's Christian Association at Plainfield, Massachusetts.

Basket-fish are not in reality fish, but echinoderms, of the class Ophinroidea. They resemble star-fish very greatly in appearance, having the same number of arms, and obtain their name from their habit of coiling these arms over their mouths when they fear danger.

Basking-Shark, sun-fish, or *Selache Maximus*, is one of the largest fishes extant, being sometimes 30 ft. in length. It belongs to the family Lamnidæand order Selachii. Its popular name is derived from its habit of basking near the surface of the water. Despite its great size and strength it is harmless unless attacked.

Basle, *see* Basel.

Basnage, a celebrated Protestant Fr. family: 1. Nicholas, a religious refugee, who came and settled in Norwich, where he had a congregation. Afterwards returned to France. 2. Benjamin (1580-1652), son of above, pastor of his father's church at Carentan; a zealous defender of the Reformed Church in France. 3. Antoine (1610-91), son of above; after the revocation of the Edict of Nantes escaped to Holland. Died at Zutphen, where he had a pastoral charge. 4. Samuel (1638-1721), son of above, born at Bayeux; preached here at first, but escaped to Holland with his father. Died at Zutphen. He wrote voluminously in Fr. and Lat. 5. Henri (1615-95), youngest son of Benjamin, born at St. Mère Eglise; studied for the bar, and became one of the most eloquent advocates in the parliament at Rouen. His works were published at Rouen, 2 vols. fol. 1776. 6. Jacques (1653-1723), son of above, the most celebrated of his family. Studied at Samur under Tanaquil le Fèvre and at Geneva and Sedan. Received into the ministry at Rouen, 1676. In 1685, when the church was

closed, he received permission to retire to Holland; settled at Rotterdam; was acquainted with many scholars of all countries, including Bayle; he was esteemed by Voltaire. His works were principally theological. 7. Henri (*1656-1710*), son of Henri above, born at Rouen, followed the profession of his father. On the revocation of the Edict of Nantes took refuge in Holland, where he died.

Basoche, or Bazoche, a corporation of the clerks of the parliament of Paris which existed from about 1303 until the time of the revolution. Philip the Fair is supposed to have been the founder, and to have granted the members certain privileges, among them exemption from the jurisdiction of the common law.

Basque Roads, The Action in. The Fr. fleet, consisting of fourteen ships, were ranged here, just below the is. of Aix, near Rochefort, when they were attacked by Lord Cochrane, in command of the fireships, and Lord Gambier, April 11 to 12, 1809. There was a panic among the Fr. sailors, twelve ships ran aground, and four were destroyed. Cochrane thought that the victory would have been more complete had he received more active support from his superior, Gambier. The latter was accused of negligence at a court-martial, but was acquitted, and Cochrane was obliged to retire on half-pay. Consult Chatterton, *Memorials of Gambier*, 1861, and Croft, *Britain on and beyond the Sea*, 1909.

Basques (Span. *Vascongados*), a peculiar race dwelling on the slopes of the Pyrenees, occupying on the S. the three Basque provinces of Biscay, Alava, and Guipuzcoa, and Navarre in Spain; on the N. the two French departments of Bayonne and Mauléon. The word B. is derived from the Latin *Vascones*, which word in its Germanic form, *Wascones*, has also given a name to the Gascons, an entirely different people. Perhaps no race has raised so much discussion as to its origin as that which we are now considering, and the question is still unsettled. There is no doubt as to the extreme antiquity of the Basque settlements on the Pyrenees. Moreover, place names throughout Spain, Sicily, Sardinia, and Corsica, bear a strong resemblance to Basque names, and may sometimes be explained from Basque derivations. It is now received pretty generally that the Basque race is connected with the ancient Iberian or Celtiberian, and was dispersed over the districts named above. Some deny the connection of the B. with the Iberi of the Romans, and make them an indigenous people who have never extended over larger regions than their present quarters. A third theory connected them with the fair-skinned African races, and would carry their origin back through some of the Berber tribes, through the ancient Libyans to a people represented on the Egyptian monuments. Lastly, may be shortly mentioned a theory deriving them from the inhabitants of a lost Atlantic continent, represented also by the Guanches of the Canary Is., and by a certain fair-skinned West African race. The B. themselves are fairer than the peoples of the S., but darker than the northern races. The race is by no means pure, and so a large range of types is found. As in complexion, so in stature, they occupy an intermediate place between the northern and southern Europeans. Their skulls are both *dolichochephalous* and *brachycephalous*, and have certain peculiar characteristics. Collignon tells us that the Basque type differs from all those he knows of Europe and N. Africa. The B. know themselves by the name *Euskaldunak*, a word formed from the name of their language *Euskara*. The origin of this word is uncertain, but the most probable meaning is 'speaking plainly.' Their tongue stands quite alone among the languages of Europe, as the only remaining example of a consistent incorporative and agglutinative tongue. Though no close connection is to be traced, it shows a remarkable affinity with the Finnic and Magyar families, which

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groups, constituting a separate class. It is, as has been said, agglutinative, modifications of meaning and grammatical relations not being expressed either by prepositions or by inflections. Instead, there is a system of post-fixing, various additions being made one after the other. Thus, *zaldi*, 'horse;' *zaldia*, 'the horse;' *zaldiak*, 'the horses;' *zaldiaren*, 'of the horse,' etc. There is a lack of general and abstract terms, though there is an abundance of particular terms. The personal pronouns, *ni*, 'I;' *hi*, 'thou;' *gu*, 'we;' *zu*, 'you,' bear a superficial resemblance to the Hamitic languages.

except in the
added to show
addressed. Thus *ezlakinat* means 'I do not know it, woman;' *ezlakiat* (for *ezlakikat*), 'I do not know it, man.' The greatest difficulty is the verb, which incorporates with itself not only the pronoun, but also the direct and indirect complements. Thus there are separate forms for 'I give it,' 'I

give it to you,' 'I give them to you,' etc., varying according to the sex of the person addressed. The regular verbal conjugations for the transitive and intransitive are now used but rarely, being reserved for the verbs 'to have' and 'to be' respectively. The language has, on the other hand, developed a conjugation by combining auxiliaries with the participles of all the other verbs. Thus instead of saying *dakust,* 'I see it,' the form is *ikusten dut,* 'I have it in seeing.' Originally, there were but two tenses, the present and the imperfect, but a conditional future has now been formed. There are no clearly defined moods. Syntax is extremely simple, as in all agglutinative languages, and the phrases are short. Composition is used to such an extent that many phrases originally distinct have now become confounded. The dialects vary considerably. Prince L. L. Bonaparte recognises twenty-five dialects, which fall into eight divisions, which can be again reduced to three great dialects, the eastern, central, and western. The history of Basque literature is short, as no ancient monuments remain. The first printed book in the language was the *Linguæ Vasconum Primitiæ,* a collection of poems by Bernard d'Echepare. Next to this comes the translation of the N.T. by Liçarague, acting under the instructions of Jeanne d'Albret (La Rochelle, 1571), which ranks as the great classic of the language. Before the 19th century, there existed no national literature, but attempts have now been made to form one. The few hundreds of volumes printed in Basque consisted chiefly of translations from French, Spanish, or Latin. The B. are of a deeply religious nature, and their country has produced two great champions of the faith, Ignatius Loyola, founder of the Society of Jesus, and Francis Xavier, the great missionary. Most of their older literature, though no MS. exists older than the 18th century, is of a religious nature. Their legends and *pastorales,* a kind of open-air drama, are mainly derived from the French. The B. have ever shown the ability to retain their independence. Though the Romans conquered them, they did not assimilate them in any way. The Visigoths did the same and no more. At the beginning of the 10th century the B. to the S. of the Pyrenees were brought into the kingdom of Navarre, but they still retained their *fueros,* or assemblies, in which they ruled themselves to a great extent. An unsuccessful attempt to abolish the *fueros* was made in 1832, but they were finally done away with in 1876. The B. are engaged in agriculture and fishing, and many of them have emigrated to the Newfoundland cod-fisheries. Their great agility was remarked in the 8th century, and still remains a characteristic. They make excellent soldiers and sailors, and their ancient renown as pirates is continued by their success as smugglers. They are extremely conservative in dress, customs, and tradition. The dress of the men is simple and graceful, consisting generally of the knickers, girded with a large red belt, open waistcoat, short tight coat, and carelessly tied kerchief round the neck, the whole surmounted by the national *béret,* a red or blue cap. The number of B. in Europe is about 600,000, of whom about 125,000 are in France, and the rest in the Spanish provinces. Of late years there has been a great deal of emigration, especially to S. America, where it is estimated that there are at present no less than 200,000 B. scattered over the Argentine Republic, Mexico, and Cuba. For the literature, see J. Vinson's *Essai d'une bibliographie de la langue basque* (Paris), 1891; for the language, W. van Eys's *Grammaire comparée des dialectes basques,* 1879, and *Dictionnaire basque-français* (Paris), 1873. See also Michel's *Le pays basque, sa population, sa langue,* 1857; Vinson's *Les basque et le pays basque,* 1882; Inchauspe's *Le peuple basque: sa langue, son origine,* etc., 1894; A. Keane's *Man, Past and Present,* 1899.

Basra, or **Bassora,** is a city of Asiatic Turkey, on the western bank of the Shat-el-Arab, the united stream of the Tigris and the Euphrates, in 47° 34′ E., and 32° N. It is surrounded by a wall 10 m. in circumference, and from 20 to 25 ft. thick. B. does a considerable transit trade between Turkey, the Persian dominions, and India; since steamer communication with Bagdad and Bombay was instituted its prosperity has considerably increased. Its chief exports are dates, camels, horses, wool, and wheat; its imports coffee, indigo, rice, etc. The settled pop. cannot be estimated with any exactitude, as it is frequented by merchants and nomadic tribes. It has been the residence of a British consul since 1898. The ruins of the ancient Bassora, formerly a centre of learning, founded by the Caliph Omar in 636, lie about 9 m. S.W. of the tn.

Bas-relief, or 'low-relief,' is a term used to denote forms of mural decoration which project very little from the background. The It. terms *basso-rilievo, mezzo-rilievo,* and *alto-rilievo* were used at the time of the Renaissance according as the sculptures projected from the surface forming a background. These terms, however

have fallen into desuetude, and 'B.' is now used as a general term to signify all 'relief' sculpture as dis- [illegible] re in the ians appear people to practise this art, but the Persians, Assyrians, and Babylonians also represented their exploits and divinities in this way. These early Bs. do not reach a very high standard, the figures being very stiff and regular in outline. After the time of Crassus, the marble sarcophagi at Rome were usually decorated at the ends with B., many well-known legends being thus portrayed. The Elgin marbles in the British Museum, which belong to the class formerly known as *altorilievo*, are the best ancient example of this class of art, whilst the Bs. of Canova, Flaxman, and Thorwaldsen have been noted in modern times. Owing to the need for a background, Bs. have always been intimately associated with the architecture of temples, palaces, etc.

Bass (It. *basso*, low), or **Base**, is a musical term denoting the lower part in the harmony of a composition, the lowest pitched of a class of instruments, or the lowest male singing voice. The B. part is only surpassed by the melody in the freedom of its movements and the richness of its effect. It contains more frequently the fundamental notes of the chords, and the 'organ-point' is formed on it. The ordinary compass of the B. voice is from F below the B. clef to D above it. Mozart gave it great prominence in opera as a solo part.

Bass, or **Basse**, the name applied to many perch-like fishes of the sub-order Acanthopterygii. The [illegible] varieties are marine, while the [illegible] can comprise sev. fresh-wat[illegible] The common bass of the fam[illegible] *ranidæ* is known as *Morone lupus*, receiving its specific name from its wolf-like voracity; it is common to the Mediterranean. Two species of black B. afford sport for American anglers; they are the *Micropterus salmoides* and *M. dolomieu* of the sun-fish family, Centrarchidæ. Nearly all B. are much valued for food.

Bass. Strictly speaking, it is the inner bark of a lime-tree; hence the word has been applied to certain articles made of fibre, such as a hassock, basket, or door-mat. The word is common in Scotland, where it is used chiefly with regard to door-mats.

Bass, Great and Little, are two ledges of rock off the coast of Ceylon in the Bay of Bengal. Both have lighthouses, and Little B. is the more dangerous.

Bass, George (*d.* 1812), an Eng. explorer, was born at Asworthy, Lincolnshire. He was apprenticed to a surgeon at Boston, Lincolnshire; joined the navy and became surgeon to H.M.S. *Reliance*. In 1795 he sailed to Australia, and explored the coast of New S. Wales and Tasmania with Flinders, 1795-1800. B.'s Strait owes its name to him.

Bass, Michael Thomas, son of M. J. B. of the famous brewing firm of Burton-on-Trent, was *b.* in 1799. He acted as traveller for the firm at first. He sat in parliament as a Liberal from 1848 to 1883. He declined a baronetcy and a peerage, both of which were afterwards conferred on his son, M. A. Bass.

Bassa, Baffa, or **Buffa**, a seaport of Liberia, W. Africa, between Cape Mesurado and Cape Palmas.

Bassadore, *see* BASIDU.

Bassam, Grand, a Fr. port of the Gold Coast, Upper Guinea, Africa, which produces gold, palm-oil, and ivory.

Bassandyne, Bassendyne, or **Bassinden, Thomas** (*d.* 1577), a printer, bookbinder, and bookseller at the Nether Bow, Edinburgh. He printed the earliest translation of the N.T. produced in Scotland in 1576, and also an ed. of Lindsay's works. *See* Dobson, *History of the Bassandyne Bible*, 1887.

Bassano, an It. city in the prov. of Vicenza, in 11° 43' E., and 45° 46' N., on the R. Brenta. The bridge over the river, 180 ft. long, was built by Palladio, as was also one of the six gates in the walls surrounding the tn. In the centre of the tn. is the tower of *Ezzelino*, which now contains an armoury and a library; the thirty-five [illegible] city contain some fine [illegible] vine and the olive are [illegible] there are extensive [illegible] anufs. of cloth, paper, porcelain, straw hats, and wax. On Sept. 8, [illegible] feated the Austr[illegible] near B., and [illegible] le of Duke of [illegible] 1809. Pop. 14,000.

Bassano, commonly called **Giacomo da Ponte** (1510-92), sent by his father to Venice to study the Venetian School of Painting, met with extraordinary success. Tasso and Ariosto sat to him for their portraits. Sir Joshua Reynolds accuses him of painting boors of the dist. and calling them patriarchs and prophets. His best works [illegible] Christ' at Pa[illegible] Christ.' He [illegible] cesco, comm[illegible] B. (1548-91), and achieved [illegible] practising at [illegible] delirium he

window and was killed by the fall. 2. Giovanni (1553-1613), chiefly known as a copyist of his father's work. 3. Leandro (1558-1623), distinguished himself as a portrait painter, but painted historical and sacred subjects occasionally. 4. Girolamo (1560-1622), much employed by his father in copying, but contributed an original piece of 'St. Barbara and the Virgin' at Bassano. The work of all the Bs. shows more manual than mental capacity.

Bassantin, or Bassintoun, James (*d.* 1568), was educated at Glasgow, and afterwards travelled, but finally settled at Paris, where he taught mathematics and astronomy. He wrote various works on mathematics, astronomy, and arithmetic, some of which are now only known by the titles which have been recorded. One of his works which was best known was a *Discours Astronomique*, Lyons, 1577, which appears to have been translated into Lat. by De Tournes (Tornesius) under the title of *Astronomia J. Bassantini, Scoti*, Geneva, 1559, reprinted 1613. His planetary system is that of Ptolemy.

Basse, or Bas, William (*d. c.* 1653), an Eng. poet. He was a retainer to Sir Richard Wenman of Thame Park, in Oxfordshire. He wrote many poems on country life; the author of *Sword and Buckler*, 1602; *Great Britaines Sunnes-set*, 1613. He is chiefly remembered for his epitaph on Shakespeare, and for a song which is quoted in Walton's *Compleat Angler*.

Bassein, a seaport of Lower Burma, and cap. of the district of B., on the riv. of that name, in 16° 46′ N. and 94° 48′ E. Prin. export is rice, and coal, salt, cotton goods, etc., are imported. Pop. 31,000.

Bassein, a tn. in the presidency of Bombay, British India, 28 m. N.E. of Bombay. It was ceded to the Portuguese by King Gujaret in 1534, and remained in their possession until taken by the Mahrattas in 1739. It was taken over by the British in 1818. Pop. 12,000.

Basses-Alpes, *see* ALPES, BASSES.

Basses-Pyrénées, a frontier dept. of France formed out of the anct. provs. of Béarn, Navarre, and Gascoigne. It is bounded on the N. by Landes and Gers, on the S. by the Pyrenees, E. by Hautes-Pyrénées, and W. by the Bay of Biscay. The principal riv. is the Adour, which is fed by many mt. torrents. About one-fifth of the area is covered with dense forests, marshes are common, and pasture-land is good. The chief product is the maize; wheat, vines, chestnuts, and flax are also cultivated. Salt and other mineral springs are numerous, the most popular being Eaux-Bonnes and Eaux-Chaudes. Marble, copper, and iron are some of the mineral products. The cap is Pau, and the pop. of the dept. is about 430,000.

Basset, a French breed of medium-sized hound with a long body, short crooked legs, and heavy head, which has been introduced into England. It was formerly used in the baiting of badgers, but is now employed in deer-hunting and in hare-hunting, in which it shows its persevering but slow nature. There are both smooth and rough-haired varieties, but the colouring is usually tan on the head and black and white on the body.

Basseterre, a seaport of the W. Indies, on the S.W. coast of the Is. of St. Christopher, of which it is the cap.; pop. 8500.

Basset-Horn (It. *corno di bassetto*), a wind musical instrument invented in Germany in 1770. It is similar to a clarionet in fingering, but contains additional low keys. The scale embraces nearly four octaves, from C, the second space in the base, to G in altissimo, including every semitone; but its real notes, in relation to its use in the orchestra, are from F below the base staff, to C, the second leger line above the treble. 'Corno di Bassetto' was an early pseudonym of Mr. G. Bernard Shaw.

Bassia is an interesting genus of tropical plants of the order Sapotaceæ found chiefly in India. *B. butyraceæ*, the Indian butter-tree, grows to a height of 50 ft., and its seeds yield a fat-like substance akin to vegetable butter. *B. longifolia*, the Indian oil-tree, has a yellowish fruit which gives valuable oil for lamps and soap, and is used in cookery by poor Indians. The flowers are fleshy and edible, the wood hard and durable as teak. *B. latifolia*, the mahua, mahwa, or mowa, has hard and strong wood, and the flowers yield by distillation a strong intoxicating spirit. *B. pallida* produces a gutta-percha.

Bassières, Jean Baptiste, Duke of Istria (1768-1813), Fr. marshal. In the Constitutional Guard of Louis XVI. he took part in the Spanish War. He won honour in the Eastern Pyrenees and the Moselle. In 1796 he served under Napoleon as captain during the Italian campaign. A distinguished career saw his return with Napoleon from Acre and Aboukir, when he was second-in-command of the Consular Guard. He was made marshal of France in 1804, and was created Duke of Istria five years later.

Bassigny, a dist. in the former prov. of Champagne, France, now forms parts of the depts. of Haute-Marne, Meuse, and Aube. Its chief towns were Langres, Chaumont, and Bourbon-les-Bains.

Bassinet, or more properly **Bascinet**, was the name of a small, close-fitting helmet like a basin, used in the 14th century. (*See* BASCINET.) The term is now used for a perambulator or child's four-wheeled carriage, and also sometimes applies to a cradle with a wicker hood.

Basso di Camera, a double-base, or *contrabasso, reduced in size and* power, but not in compass. It has four strings, two of gut and two covered with silver wire, all proportionately thicker than those of the violoncello, and tuned in fifths, to the same literal notes as the violin, but two octaves lower than the latter.

Bassompierre, François de (1579-1646), marshal of France and captain-general of the Swiss Guard, born in Lorraine of a noble and military family; caught the attention of Henry IV. with whom he soon became a great favourite; took part in the civil wars (mostly of religious origin), appointed captain-general of the Swiss Guards; under Louis XIII. ambas. to Spain; 1626 sent to England by Richelieu to enforce the marriage treaty between Henriette Maria and Charles I. in so far as it related to toleration of Roman Catholic worship. Supported Mary de Medici against Richelieu, at whose instance he was arrested and sent to the Bastille for twelve years; released at Richelieu's death; died of apoplexy three years [illegible] *du Marc-* 723; *B.'s*

[illegible]er. *Fagott.* It. *fagotto*), a wood wind instrument with a double reed mouthpiece, forming the bass of the oboe family. Its direct ancestor was the bass pommer, which was straight and 6 ft. in length; the tubes of which the B. is formed resemble a bundle, hence the Ger. and It. names for the instrument. It consists of five pieces, joined together into a wooden tube 93 in. long, which *has a conical bore tapering from a* diameter of 1¼ in. at the bell to $\frac{1}{16}$ in. at the reed. The pieces are known as the bell, the long joint, the wing, the butt, and the crook, to the last of which the mouthpiece is attached. The performer holds the instrument in a diagonal position, passing its strap around his neck; the notes are produced by seven holes, and sixteen, seventeen, or nineteen keys. The mechanism and fingering are very intricate. From an acoustic point of view the B. is a badly-constructed instrument, but in practice it affords the artist a scope surpassed only by the stringed instruments. Its compass comprehends three octaves, rising from B flat below the bass staff. It has been a favourite instrument with all the masters save Handel, several having written concertos for the B. with orchestra.

Bassora, *see* BASRA.

Bassora Gum, so called because it comes from Bussorah on the Gulf of Persia, is a gum said to be derived from plum and almond trees, and is often used to adulterate gum tragacanth.

Basso-rilievo, *see* BAS-RELIEF.

Bass Rock, a conical insular rock at *the mouth of the Firth of Forth*, 3 m. from N. Berwick. It is about a mile in circumference, and rises to a height of 315 ft. It has an imposing aspect with its precipitous lofty walls; a huge cavern runs from the N.W. to the S.E., which is explorable at low tide. It is inaccessible save on one shelving point on the S.E. side. Purchased by the English gov. in 1671 from the Lauder family, the castle was converted into a state prison, in which sev. eminent Covenanters were confined. *The rock was held for King* James II. by sixteen Jacobites (four of them former prisoners on the rock) against a small army of King William III. After a siege of three years (1691-94) the plucky but diminutive garrison was compelled to surrender owing to provisions running short. Their spirited resistance secured them honourable terms. The fort was demolished in 1701. The rock is now private property, being farmed for the sea-fowls that abound here in the *breeding season.*

Bass Strait is situated between Australia and Tasmania, and was named after Surgeon George B. of H.M.S. *Reliance*, who sailed round Tasmania in 1798. The strait is studded with islands and coral-reefs, so that navigation is rendered difficult.

Bass Tuba, another name for the B. saxhorn in F or E flat. It is sometimes applied to the euphonium.

Bassus, a genus of hymenopterous insect of the family Braconidæ. They are closely allied to the Ichneumon flies, have four wings, long and narrow bodies, and frequent the flowers of umbelliferous plants.

Bast, in its two forms soft and hard, constitutes what is known in botany as *phloem*. The soft B. consists of sieve-tubes, companion-cells, and parenchyma cells, and the sieve-tubes are employed in carrying food-material from the leaves to the rest of the plant; the hard B. is composed of long, narrow B.-fibres resembling wood-fibres, and parenchyma cells.

In commerce the B. fibres of flax, hemp, and jute are sold for various purposes.

Bast, Frederick James, was born in the state of Hesse-Darmstadt, *c.* 1772 He afterwards studied in the Univer-

sity of Jena, under Professors Griesbach and Schutz. His first literary essay was a commentary upon Plato's *Symposion*, which was followed in 1796 by a specimen of an intended new ed. of the letters of Aristænetus. B.'s literary labours were devoted to verbal criticism. His *Lettre Critique à M. J. F. Boissonade sur Antoninus Liberalis, Parthenius, et Aristenete*, 8vo, Paris, 1805, is an example of the style of his studies, and his erudition.

Basta, Georg, Baron of Sult (1550-1607), an Austrian general, born at Rocca, S. Italy. He served under Alexander Farnese in the Low Countries, 1589-90, and occupied Transylvania in 1598. In 1603 and 1604 he harshly suppressed risings which were largely due to his rapaciousness and cruel administration.

Bastan, *see* BAZTAN.

Bastar, or Bustar, a feudatory state of India in the Central Provs. The R. Indravati traverses it, there are many hills and forests, but the whole dist. is unhealthy and ill-populated. The cap. is Jagdalpur, and the pop. of the state about 300,000.

Bastard means a person born out of lawful wedlock and (where allowable) not subsequently legitimated. By the English law a child born during the marriage of his parents is legitimate, even if the child is begotten out of matrimony. The fact of birth during marriage or within a certain time after the husband's death raises a strong presumption of legitimacy, rebuttable only by proof of non-access on the part of the husband. By the Scotch law and most continental systems, which are based on the canon and civil laws, a B. may be legitimised either by the subsequent marriage of his parents, or by special dispensation not affecting the rights of third parties. Civilly the B. is *filius nullius* for most purposes, and is therefore heir to none of his reputed ancestors and entitled to no share of the personal property of his reputed parents if they die intestate. Nor has he a surname until he acquires one by reputation. But even the English law admits a B. to be the son of his putative father and his natural mother for purposes of maintenance. A B. takes as his primary settlement for poor law purposes the place where he was born, but a legitimate child takes his father's bp. The English law relating to the maintenance of Bs. is to be found in a number of statutes, the nature of the changes in the law indicating that no settled principle has regulated our legislation on this subject. By the Bastardy Laws Amendment Act, 1872, the mother of a B. may summon the putative father before petty sessions within twelve months after the birth of the child, or at any later time if he is shown to have contributed to the child's support within twelve months, and the justices, on the mother's evidence being corroborated, may adjudge the man to be the putative father and order him to pay five shillings a week for its maintenance. Such order becomes invalid after the child attains thirteen, but the justices may in their original order direct that the maintenance be paid until the child attains sixteen. An appeal lies to quarter sessions. The mother only may apply for such an order, though in case of her death or incapacity or omission to apply before the child becomes chargeable to the poor rate, the poor law guardians may proceed against the putative father. The custody of a B. belongs to its mother in preference to the putative father.

Bastard Bar is a name sometimes employed erroneously in speaking of the *baton-sinister* (*q.v.*).

Bastardy, Declarator of, is a suit which holds in Scottish law for the disposal of the effects of a deceased illegitimate child. The recipient of the estates must receive a deed of gift from the crown to state that he is entitled to them, and the *defender* is represented by any person or persons who could pretend to heirship if the owner had been born in wedlock.

Bastennes, a Fr. vil. in the dept. of Landes. It is noted for its rich asphalte mine and two mineral springs.

Basti, or Busti, a tn. of the United Provs., India, 115 m. from Lucknow; pop. about 15,000.

Bastia, a tn. and seaport on the E. coast of the is. of Corsica, 95 m. N.E. of Ajaccio, the present cap. B. was formerly the cap., and still has the chief trade, mainly in soap, leather, liqueurs, and wax. Pop. 22,000.

Bastian, Adolphe (1826-1905), a Ger. traveller and ethnographer, was born at Brême. He was educated as a physician, but in 1851 he started on the first of his many voyages. This first voyage lasted for eight years, and he travelled round the world in the course of it. Between 1864 and 1866 he visited the Indian Archipelago and Japan, the desert of Gobi, the Ural and Caucasus Mts., and the Caspian and the Black Seas. He was created Professor of Ethnology and administrator of the ethnological museum at Berlin, and later was president of the Berlin Anthropological Society. He organised the station of Chinchoxo on the coast of Loango, and completed the ethnographical collections of the Royal Museum at Berlin. In 1875-6 he visited Equatorial America, and between 1875 and 1880 he went to Australia, Polynesia, and Central and

S. America. In 1889-91 he travelled from Central Asia to America. His numerous works are connected with ethnology and anthropology, and throw light on many questions of linguistics, religions, and geography. His chief work, *The Peoples of Eastern Asia*, was published in 1866-67.

Bastian, Henry Charlton, an Eng. biologist and physician, was born at Truro in 1837. He was educated at Falmouth and University College, London, taking his M.A. in 1861, his M.B. in 1863, and his M.D. in 1866. He was assistant curator in the University Museum from 1860-63, and from 1864-66 head officer in Broadmoor Criminal Lunatic Asylum. In the latter year he was appointed lecturer on pathology and assistant physician at St. Mary's Hospital, in 1875 professor of pathological anatomy at University College, and from 1887-95 he was professor of medicine and clinical medicine. He has contributed largely to medical and other periodicals, and to Quain's *Dictionary of Medicine*. His more important works include: *Modes of Origin of Lowest Organisms*, 1871; *Beginnings of Life*, 1872; *Evolution and Origin of Life*, 1874; *Brain as an Organ of Mind*, 1880. He has advocated the theory of spontaneous generation.

Bastiat, Frederic (*1801–50*), a Fr. economist, was born at Bayonne, June 29. He was educated at Saint-Sever and Sorèze Colleges, and in 1818 entered the counting-house of his uncle. This occupation proved distasteful to him, and in 1825 he retired to a property at Mugron, of which he became the owner on the death of his grandfather. Here he passed his time in farming and meditation until the revolution of 1830, which he welcomed with enthusiasm. He became a *juge de paix* for his canton in 1830, and in 1832 a member of the General Council for the Landes. He followed the progress of Cobden's Anti-Corn Law League with interest, and formed a parallel association in France. After the revolution of 1848 he was elected to the constituent and legislative assemblies, and pub. many brochures against socialism and protection. He died at Rome, Dec. 24, of a lingering disease. His pamphlets against socialism and protection are considered by many to be masterly; his great economic work was cut short by death.

Bastide, Jules (1800–79), a Fr. politician, was born at Paris on Nov. 22. He studied the law, but after a time became a timber merchant. He was a member of the Fr. 'Carbonari,' and took part in the revolution of 1830. He was given an artillery command in the National Guard after 'the July days,' but for his share in the riot on the occasion of Gen. Lamarque's funeral in 1832 he was sentenced to death, and fled to London. He was acquitted on returning to Paris in 1834, and after founding the *Revue Nationale* in 1847 with P. J. Buchez, he became minister of foreign affairs in 1848, but at the end of the same year retired into private life, dying on March 2.

Bastide-de-Clairance, tn. of Basses-Pyrénées dept., France, 13 m. S.E. of Bayonne. It has copper and iron-mining industries. Pop. 2000.

Bastide-de-Serou, a tn. of Ariège dept., France, 9 m. N.W. of Foix. The chief industry is the making of glass-melting pots, for which yellow and grey clay is found in the neighbourhood. Pop. 2500.

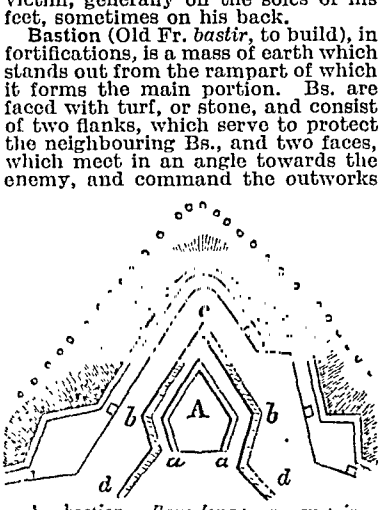
Bastien-Lepage, Jules (1848–84), a Fr. painter, was *b.* in the vil. of Damvillers, in the Fr. dept. of Meuse, on Nov. 1. There he passed his childhood, and in 1867 went to Paris to the Ecole des Beaux Arts, where he studied under Cabanel. He exhibited in the Salons of 1870 and 1872, but without any conspicuous success. In 1874, however, his 'Song of Spring,' a study of rural life, attracted much attention, and his succeeding pictures served to establish his fame. In 1874 he gained a third-class medal with his 'Portrait of my Grandfather,' and in the following year his picture 'Angels appearing to the Shepherds' gained the second prix de Rome. His picture called 'The Hayfield,' which he first exhibited at the Salon of 1877, and which is now in the Luxembourg, is a typical example of his realistically truthful and simple style. He was now recognised as the leader of a school, and he gained the Cross of the Legion of Honour in 1879 by his portrait of Mdme. Sarah Bernhardt. He exhibited in the Royal Academy of 1880. His health, which had been failing him ever since he served under the painter Castellani as a franc-tireur in the war, broke down, and he went to Algiers to recuperate. He grew worse, however, and returned to Paris, dying on Dec. 10.

Bastille is the Fr. name for any castle with towers, but as a proper name it signifies the old state prison and citadel of Paris. This was built about 1370 by Charles V., but came to be used as the place of confinement for persons of rank who had fallen out with the court or the king, and also for those writers who attacked the gov. or any powerful person. It was this fact which caused it to be so cordially detested by the populace as an emblem of tyranny. The capture

of the B. on July 14, 1789, was the commencement of the Fr. Revolution. The mob, after attempting to negotiate with the governor, Delaunay, attacked it, and by the help of artillery captured it. Delaunay was lynched as he was being taken to the hotel-de-ville, and the B. was completely destroyed by the mob. A column in the Place de la Bastille now marks its site.

Bastinado (Fr. *bâton*, cudgel), the European name for an oriental form of punishment which consists in inflicting blows with a stick upon the victim, generally on the soles of his feet, sometimes on his back.

Bastion (Old Fr. *bastir*, to build), in fortifications, is a mass of earth which stands out from the rampart of which it forms the main portion. Bs. are faced with turf, or stone, and consist of two flanks, which serve to protect the neighbouring Bs., and two faces, which meet in an angle towards the enemy, and command the outworks



A, bastion, *Barcelona*; *a*, curtain angle; *b*, shoulder angle; *c*, salient angle; *a*, *a*, gorge; *a*, *b*, flank; *a*, *d*, curtain; *b*, *c*, face.

and the ground in front. The fifth side, which is open to the interior, is known as the gorge. Bs. are built in a variety of ways. Some have walls quite solid, others have a space in the middle; some are 'double,' that is, they have extra flanks, and faces, raised behind the other on the same plane; some have low ramparts outside, some casemates, or orillons, etc.

Basurhat, or **Bussirhat**, a tn. of Bengal, 30 m. from Calcutta; pop. about 15,000.

Basutoland is a dist. in the E. of S. Africa, bounded on the N. and W. by the Orange Free State, on the S. by Cape Colony, and on the E. and N.E. by Natal. The surface is hilly, and the average height above the sea is over 5000 ft. The Maluti Mts. and the Molappo Mts., which are parallel to the Quathlamba range, divide the country into three almost equal dists.: the head-waters of the Tugela R., the Kornet Spruit, the Caledon R., and the Senka R. lie in B. The climate is temperate, and the average rainfall is about 32 in. per annum. The country is very fertile, and large quantities of maize and wheat are grown. The ponies of B. are hardy and exceedingly sure-footed, whilst sheep and cattle are also reared. There are few forests, and much of the country is uninhabited. The natives are intelligent, industrious, and brave; their fastnesses in the mts. are almost inaccessible. After a war with the Free State, the country was placed under British protection in 1868, and annexed to Cape Colony in 1871. After the rebellion in 1880, the country came under the direct administration of the imperial gov. in 1884. Its area is 9720 sq. m., and pop. 350,000.

Basyl, or **Basyle** (Gk. *βασις*, base, *ὑλε*, matter), a name formerly in use to indicate a metal or group which acts as a base.

Bat, The, or *Chiroptera*, forms a large order of mammals, nearly related to the Insectivora (hedgehogs, shrews, etc.), but differing from them in having the power of bird-like flight and consequent physical adaptations. The fore-limbs are greatly developed, and between each of the four fingers is a skin expansion which extends to the side and the hind legs; another expansion spreads from the tail to the hind legs. The thumb does not share in the flight-modifications, and is clawed, its uses being those of attachment and occasional efforts to walk. The shoulder girdle and breast-bone are very large, the latter extended to a keel, while the pelvic girdle is small and weak. The bones of the limbs have large medullary cavities, but other bones are slight, and the ribs are much flattened. The females have either one or two pairs of thoracic mammæ, and give birth usually to a [illegible] they carry with [illegible] which are born [illegible]. The [illegible] sense is remarkably strong, contradicting absolutely popular opinion, while the senses of smell, taste, and hearing are all present to a large degree. Feeling they possess intensely, the membranes of the nose and the wings being filled with numerous nerves in addition to many blood-vessels; the experiments of Abbé Spallanzani in 1775 proving that Bs. deprived of sight and hearing are yet able, in a room across which have been stretched innumerable strings, to fly without coming into contact with one of them. Many have curiously-shaped fleshy appendages called *nose-leaves* round the nose and mouth, and these are

peculiarly sensitive. The ears of all Bs. are very large, prominent, and mobile. *Bs. inhabit all parts of the globe* except the coldest regions, but abound chiefly in the tropics. In *habit they* are nocturnal, sleeping during the day head downwards, holding to some object with their curved claws. They hibernate in belfries, caverns, and *forests*, and in some cold climates, such as that of Canada, they migrate to warmer *places for the winter* season. At twilight they search for food, which in most cases consists of insects, in some of fruit, and of a minority of the blood of mammals. They are classified according to the food they eat into *Megachiroptera*, or *frugiverous forms, and Microchiroptera*, or insectivorous forms. To the first class belong the *Pteropus edulis*, or flying fox, the largest known species of bat, which sometimes measures 5 ft. across the wing; *Epomorphus* of Ethiopia; *Cynonycteris* of the Egyptian pyramids. To the second class belong the genera *Rhinolophus*, or horse-shoe B.; *Nycteris*, or leaf-nosed B.; *Megaderma*, of which *M. lyra*, the lyre-bat, attacks other Bs., frogs, and small mammals, and sucks their blood; *Vespertilio*, the common naked-faced B. of most countries; *Vesperugo*, of which *V. pipistrellus*, the pipistrelle, is well known; *Synotus*, of which *S. barbastellus* is the barbastelle. There are in all nearly 100 genera of Bs., and among others should be mentioned the true *vampires*, or blood-suckers; these belong to the *Desmodus* and *Diphylla*, and will attack even men and horses; the genus *Vampyrus*, to which the repulsive *V. spectrum* is attached, consists strangely enough of frugivorous and insectivorous animals. *See* G. E. Dobson's *Catalogue of the Chiroptera in the British Museum*, 1878.

Bataan, a prov. of Luzon, Philippine Is., on the W. of the Bay of Manila; pop. about 50,000.

Batac, or **Batag**, a tn. of Luzon, Philippine Is., in the prov. of Ilocos Norte, near Laoag. It is situated in a fertile dist., and has sugar factories. Pop. 20,000.

Bataks, *see* BATTAS.

Batala, or **Butala**, a tn. of the Amritsar div. of the Punjab; pop. about 30,000.

Batalha, a tn. in Estremadura, Portugal, 7 m. from Leiria. It contains a famous Dominican convent, and received its name from King John I.'s victory at Aljubarrota in 1385. Pop. 4000.

Batan, a seaport of Panay Is. in the Philippines; pop. 14,500.

Batang, or **Battam**, an is. opposite Singapore, in the Malay Archipelago.

Batangas, a tn. of the Philippines in the is. of Luzon, cap. of the B. prov., and 58 m. S. of Manila. A well-built tn., it was founded in 1581, and *contains a palace, the residence of the* alcade. It has a considerable trade in native produce with Manila. The prov. itself is mountainous in character. The pop. of the prov. is about 380,000; of the town, 40,000.

Batara, the name given by D'Azara to the bush shrikes which form the genus *Thamnophilus*. They come from S. and Central America, and belong to the family Formicariidæ. The males are usually black above, whitey-brown beneath, and in length do not exceed 13 in. *T. nævius* has a rounded and comparatively short tail; *T. vigorosii* has a large reddish crest, blackish at the apex.

Batatas, now included in *Ipomœa*, is a genus of Convolvulaceæ, found in warm countries. The name is Malayan, and the plant originally occurred wild in the woods of the Malay Archipelago, but it is now widespread, and *B. edulis*, sweet potato, is cultivated in tropical America. The tuberous roots are sweet, mealy, and wholesome, but slightly laxative, and are eaten as potatoes, plants which became their substitute in Europe and appropriated their name.

Batavi, an ancient race of Celts or Germans, mentioned by Tacitus as a branch of the Chatti, a great German tribe. They inhabited the land between the Rhine, Waal, and the Maas, called the Insula Batavorum. When subject to the Romans they received many advantages from them, and their cavalry was frequently used by their conquerors.

Batavia, name of the capital of the Dutch East Indies situated in prov. of same name, on the N.W. coast of Java. It is near the mouth of the Tjiliwong, or Jaccatra, the latter name also being that of the native town on the site of which B. was built by the Dutch early in the 17th century. The town was for many years proverbially unhealthy, for the early Dutch colonists had made, as it were, a miniature Holland of B., the town being intersected by a network of canals. What added to the unhealthiness of the town in its earlier days was the city wall, but this was demolished early in the 19th century when B. fell into the hands of the French. A new town (Weltevreden) has been built inland on higher and more healthy ground about 2½ m. from the old, and as the bay on which B. stands is yearly becoming more shallow, the new port of Tanjong Priong has been constructed (1880). 6 m. to the N.E. B. has an export trade of nearly £2,000,000 annually

about half of which is with Holland. Pop., city, 150,000; prov., 1,300,000.

Batavia, U.S.A., cap. of Genesee co., New York, situated on Tonawanda Creek, about 40 m. N.E. of Buffalo. Manufactures farm implements. The state Institute for the Blind is situated here. Pop. 11,000.

Batavian Republic, the name by which the Netherlands were known from May 16, 1795, till June 8, 1806, *i.e.* from the conquest of the country by the French till the appointment of Louis Bonaparte as king of Holland.

Batchian, Batshian, or Batjan, an is. of Dutch E. Indies; one of the Ternate group of the Molucca Archipelago, S.W. of Halmahera Is. Area 850 sq. m. It is mountainous and fertile, but is only inhabited on the coast. It was captured from Spain in 1610. The chief tn., Batchian, has a pop. of 2000.

Bateman, Sir Frederic (1824-1904), an English physician and scientific writer. He graduated, 1850, at the Aberdeen University, and became a fellow of the Royal College of Physicians, 1876. He was knighted in 1892. Author of *Aphasia and the Localisation of Speech*, 1870; *The Idiot: his Place in Creation*, etc.

Bateman, John Frederick, La Trobe (1810-89), civil engineer, was born near Halifax. Though he devoted some attention to such problems as how to measure rainfall, and wrote technical pamphlets, his life work was the construction of reservoirs and water-works. Owing to his suggestion, Manchester obtained its water supply from Lake Thirlmere and Glasgow from Loch Katrine. He also superintended the construction of the water-works of many other large towns, and was responsible for the water schemes of Buenos Ayres, Naples, and Constantinople.

Bateman, Kate Josephine (*b.* 1842), daughter of Col. B., theatrical manager, was born in Baltimore, U.S.A., and married George Crowe, former editor of the London *News*, in 1866. Her first appearance on the stage was at the age of four, in the *Babes in the Wood*, but later she played chiefly in Shakespearean and classical drama. She acted at the St. James's Theatre of London in *Richard III.* in 1851, but her first London success was as Leah, in *Deborah*, at the Adelphi, in 1863. Other successes were in *Medea*, 1872; *Macbeth* with Henry Irving in 1875; *Queen Mary*, 1876, *Colonel Newcome*, 1906; *False Gods*, 1909. Since 1892 she has conducted an excellent school of acting.

Bateman, Sydney Frances (1823-81), actress and dramatist, was brought up in Ohio. Her two most popular plays were *Self*, a comedy, and a tragedy, *Geraldine*. Coming to England she successfully undertook the management of the Lyceum, and later of Sadler's Wells.

Bateman, William (*c.* 1298–1355), Bishop of Norwich, and founder of Trinity Hall, Cambridge. He studied civil law at Cambridge; in 1328 became archdeacon of Norwich, his birthplace; his ability recommended him to Pope John XXII., and after a period of residence in the papal court, he became auditor of the palace; Pope Benedict XII. appointed him dean of Lincoln about 1340. During the wars in France he undertook diplomatic negotiations between Edward III. and the Fr. king, 1343-54. In 1344 he succeeded Antony Beke as bishop of Norwich, and was consecrated by the pope at Avignon. In 1350 he founded a college at Cambridge, which he called 'Trinity Hall' for the purpose of training students of canon and civil law to fill the places of those clergy who had died during the Black Death. B. died at Avignon, possibly through poisoning, when on an embassy to negotiate peace with France.

Bates, Harry, sculptor (1850–99), was born in Herts. Having won, after four years' study, the travelling scholarship of £200 at the Academy Schools, he went to Paris in 1883 to study under Rodin. In 1892 he was elected A.R.A. 'Love and Life' is considered his masterpiece, whilst vigour and grace in composition and refined technique characterise both his portraits and his subjects from Greek legend.

Bates, Henry Walter (1825–92), an Eng. naturalist and explorer, was born at Leicester, Feb. 8. His father was a manufacturing hosier, and his son entered the business, but in 1844 he met Alfred Russel Wallace, and in 1848 they sailed together in a trading vessel to Para. They had practically no money, but hoped to sell their collections when made. B. was eleven years in the country, made his way up the Amazon for 1400 m., and discovered 8000 new species of insects. He was made assistant-secretary of the Royal Geographical Society in 1864. In a paper which he read to the Linnean Society on the insect fauna of the Amazon valley, he stated and solved the problem of mimicry. His best known work is the *Naturalist on the Amazons*, 1863, which he pub. at the request of Darwin. He amassed a unique collection of coleoptera, which was purchased intact at his death.

Batesar, a pilgrimage tn. in India, 35 m. S.E. of Agra, on r. b. of the Jumna. It has a commercial fair.

Bath, in its original and still most popular sense, is the plunging of the

body into water, fresh or salt, hot or cold, but the meaning is now extended to the application of some unusual substance to the body or the alteration of the enveloping atmosphere. Cold water bathing, both in sea and in fresh water, is excellent for those of strong constitution, but many whose health is not robust find themselves unable to bear the shock of the low temp., and for this reason care should be taken that the bather is a fit subject before he indulges in it. In allaying fevers, easing convulsions, and in various diseases bathing is invaluable. The institution of bathing is of eastern origin, and among many oriental peoples was a religious *rite*. It was extensively practised among Jews, Buddhists, and Mohammedans, and prevailed among the Gks. at an early period, and was subsequently much valued by the Roms. The spread of the custom came through the Roms., who never formed any colony throughout the Old World without building one of their famous Bs. These were often magnificent structures and closely resembled in number of chambers and uses the modern Turkish B.; they were used as lounges by the Roms., who resorted to them daily for rest and recreation. At Pompeii there are remains of such places, as there are wherever Roman ruins are to be found. In England today the Turkish B. is popular on account of its stimulating influence on the system, but many other forms of bathing are more common. In the Turkish B. the bather passes from one warm air room to another until he perspires from every pore, then undergoes a shampoo, ending with being sprayed with warm water, steadily decreasing in heat until it runs cold. Hot-air Bs. may also be impregnated with such substances as sulphur or eucalyptus; brine Bs. are common to some places, and contain so much salt that the body must be held down to prevent it from floating; electric Bs. are water Bs. into which currents of electricity are introduced; animal Bs. consisted of wrapping the body in the hide of a newly-killed animal, or of insertion of *part of the body in the yet living* animal; mineral Bs. are common to spas all over Europe.



THE ROMAN BATH, BATH

Bath, the chief city of Somersetshire, is situated in the beautiful valley of the Avon, 107 m. W. of London. B. is built in a natural amphitheatre, and as the character of its [illegible] corresponds with [illegible]m, it has an [illegible] o other Eng. [illegible] and especi- [illegible] cacy of its

medicinal spring, have long made B. the resort of fashion. The houses of B. are all built of the white freestone known as 'bathstone' (*q.v.*). The numerous and handsome public buildings of B. include the Assembly Rooms, the Pump-Room, the city markets, and the Guild Hall. The finest of the numerous churches are the Abbey Church, one of the finest specimens of Perpendicular Gothic architecture, recently restored, and the Rom. Catholic Priory Church, a handsome building with a spire 200 ft. high. B. has a lovely park and numerous open spaces, many educational establishments, a museum, theatre, hotels, etc. The chalybeate springs supply six different establishments, and are most useful in gout, rheumatism, cutaneous diseases, etc. No manufs. of importance are carried on in the tn., though coal is found in the vicinity. B. is of great antiquity, being called Aquæ Sulis by the Roms. Magnificent remains of the Roman baths exist. Richard I. granted the tn. its earliest existing charter, confirmed by Henry III. and extended by George III. B. was most famous in the days of 'Beau Nash,' from 1704-61. The follies and vices of the city have frequently been commemorated by Fielding, Smollett, Anstey, etc. B. is, with Wells, the seat of a diocese, returns two members to Parliament, and has a pop. of 50,000.

Bath, a city of the United States, co. seat of Sagadahoc co., Maine, on the western bank of the Kennebec riv., 36 m. N.E. of Portland. It has a good harbour, and ship-building is the prin. industry. Other manufs. are iron, brass, and lumber, and there is a trade in ice, coal, and iron and steel. Pop. 12,500.

Bath, Knights of the, a British order of knighthood, whose origin is uncertain, though it is traditionally attributed to Henry IV., who bestowed the order on forty-six knights on the day of his coronation. It was allowed to lapse from the time of Charles II. until the reign of George I. when it was revived, and the number limited to the king and thirty-seven knight-companions. It was formally instituted in 1815, and in 1847 it was extended to civilians. The order now consists of three classes; the members of the first class are knights of Grand Cross (G.C.B.); those of the second class Knights Commanders (K.C.B.); and those of the third class Companions (C.B.). Each of the classes is subdivided into military, civil, or honorary members. The Dean of Westminster is dean of the order. The ribbon of the order is crimson, and the badge a gold-white cross (mil.), gold oval (civ.); the motto is 'Tria juncta in uno.' The two first classes also wear a star.

Bathbrick, the name given to the cakes of siliceous sand used for scouring vessels, cleaning knives, etc. These cakes are made from the sand of the R. Parret, and manufactured only at Bridgwater, in Somerset.

Bathgate, a market tn. of Linlithgowshire, Scotland. Coal, freestone, and limestone are found in the neighbourhood; there are also paraffin works and a distillery. Pop. 9000.

Bathometer, or Bathymeter (Gk. *βαθύς*, deep, *μέτρον*, measure), is the name applied to an instrument which is used in deep-sea sounding, especially for one when the depth is inferred by the force of gravity.

Bathori, or Battori, the name of an eminent Hungarian family, from the better-known branch of which sev. illustrious personages have sprung. Stephen B., born in 1532, so distinguished himself in the army that he was unanimously elected to the sovereignty of Transylvania in 1571, on the death of John Sigismund Zapolya, nephew of the King of Poland. In 1575 he was elected to succeed Henry of Valois on the Polish throne, and was crowned at Craçow in 1576. The internal condition of Poland at this time was very unsatisfactory, dissension being rampant, but Stephen soon effected a great improvement. He thereupon declared war against the Czar of Muscovy, and emerged the victor. He *d.* suddenly at Grodno in 1586. Stephen's nephew, Sigismund B., became prince of Transylvania in 1581, and showed remarkable skill and talents. He freed the land from the Turkish power, but out of mere caprice resigned his dominions to the Emperor Rudolph II., who in return created him a cardinal, and gave him two principalities in Silesia. He quickly changed his mind, and on being invited by the Transylvanians, returned, but all his luck and talent forsook him. Many times defeated and disgraced, he was sent to Prague by the emperor, and died there in 1613. Elisabeth B., niece of Stephen, and wife of Count Nadasdy of Hungary, is notorious as a type of inhuman cruelty. The rumours current that she used cruelly to murder young girls to bathe in their blood was shown to have some foundation in 1610, when investigations were made, and it was discovered she had killed over 600 girls. She was shut up in Csej fortress, and died there in 1614. For the connection of this case with the 'were-wolf' tales, *see* the *Book of Were-Wolves* by S. Baring-Gould.

Bathos (Gk., depth), a term which indicates the descent from lofty

thought in speech or writing to the commonplace or ridiculous, *e.g.* in Pope's

'Where thou, great Anna, whom three realms obey
Didst sometimes counsel take, and sometimes tea.'

Bathsheba, wife of Uriah, and mother of Solomon. King David, seeing her one day from the roof of his palace, bathing in a court, coveted her. Not daring openly to commit adultery he despatched Uriah, with a letter commanding his destruction, to Joab, who was besieging Rabbath Ammon. His device succeeded. He wedded B., and Nathan rebuked him. She attained the full splendour of queen-mother when Solomon bowed down before her.

Bathstone, the name of a species of oolitic limestone, so called because it is found near Bath. It is used for building purposes. When just quarried it is soft, but though it becomes hard on exposure to the air, it is not very durable.

Bathurst, the prin. tn. of the western dist. of New S. Wales, on the S. bank of the Macquarie riv., in 32° 25′ S. and 149° 42′ E. It has sev. tanneries, breweries, and flour mills, and manufs. soap, candles, boots and shoes, furniture, etc. Pop. 10,000.

Bathurst, a tn. formed by the British on the is. of St. Mary's, W. Africa, on the mouth of the Gambia R., in 13° 24′ N. lat. Prin. productions are gum, bees'-wax, ivory, and gold. Pop. 6500.

Bathurst, Allen, Earl (1684–1775), born at Westminster; entered Trinity College, Oxford, 1699. Entered parliament for Cirencester, 1705; promoted union with Scotland and opposed Marlborough; made a peer, 1711; appointed treasurer to George III. (then Prince of Wales) until death of George II., 1760. Received a pension of £2000 and was advanced to an earldom; he was a friend of Pope, Swift, and Addison. Henry, his son (1714-94), was made chief justice of the Common Pleas, 1754, and lord chancellor, 1771, with the title of Baron Apsley; resigned 1778.

Bathurst Island, one of the Parry Is., off N. Australia, 120 m. W. of Port Essington. It lies between Cornwallis Is. on the E. and Melville Is. on the W. Discovered by Captain Parry in 1819. Length about 30 m. It is partly covered with forests and partly unproductive.

Bathybius (Gk. *βαθύς*, deep, *βίος*, life), a name applied to a slimy mass discovered in great depths of the ocean and first described by Huxley in 1868. *B. Haeckelii* was supposed then to be a new organic mass, but the theory has since been completely disproved, and it is believed to have been caused by the addition of alcohol to the sulphate of lime in the seawater. *Proto-bathybius* is the name given by Dr. Bessels in an Arctic expedition of 1876 to a similar substance found in Smith's Sound. The *Challenger* expedition of 1872-76 finally disproved the theories of Huxley and Haeckel regarding bathybius.

Bathycles, a celebrated ancient Greek sculptor, of Magnesia on the Mæander in Lydia. Though his time is uncertain, several scholars have attempted to estab. it. B. was the artist who made the throne of the Amyclæan Apollo at Amyclæ, near Sparta. Quatremere de Quincy, in his *Jupiter Olympien*, has given a view of the god and his throne, designed from the description of Pausanias.

Bathymetry, *see* BATHOMETER.

Batignolles, formerly a tn.; now an arron. in the north-west of Paris.

Batiste is a material made of fine linen or cotton lawn; in France the term is applied to cambric. The inventor of the material was a certain Baptiste of Cambrai.

Batley, a tn. in the W. Riding of Yorkshire, on the L. and N.W.R., the G.N.R., and Leeds and Manchester Railways. It is a municipal bor., since 1868, included in the parl. bor. of Dewsbury. The prin. manuf. of B. is woollen goods; it is the headquarters of the heavy woollen trade, in pilots, druggets, shoddy, etc. Pop. 31,000.

Batman, a weight used in the East which varies according to the locality. In Aleppo and Smyrna it is equivalent to 16 lb. 15 oz. 14 dr. *avoirdupois*; the greater Turkish B. is about 157 lb., the lesser about 39 lb.

Batman (Fr. *bât*, pack-saddle), a term used in the British army to indicate the soldier-groom of an officer, originally the man who was in charge of a bat-horse, or baggage animal.

Batman, John (1800–40), the reputed founder of Victoria, was a settler in Van Diemen's land. He formed a company to colonise Port Philip, and proceeded thither in 1835. He obtained from the aborigines a tract of 600,000 ac., including the present site of Melbourne, but on returning home his title to the land was declared invalid.

Batna, fortified tn. in Algeria, on the Biskra Railway, 65 m. S.S.W. of Constantine. It is near the splendid cedar forests of Mt. Tugurt. Alt. 3471 feet; pop. about 7000.

Batn-el-Hajar (womb of rocks), a stony dist. of the Nile Valley of Nubia. It stretches for a distance of

about 95 m., and has many lofty granite hills.

Batolites (Fr. *baton*, a stick, Gk. λίθος, stone), a genus of very long bivalve fossil shells which occur as rocks in the Alps in the Cretaceous system. They are Lamellibranchs, and are closely allied to the *Hippurites*.

Baton (Fr. *baton*, a stick) is a short staff or club. The name is applied to several articles. The short staff presented to every field-marshal by the king, as the symbol of authority, is known as a B. The long staff which is carried by the drum-major of an infantry regiment is also so called, as is the truncheon of a policeman. The B. of the conductor of an orchestra is at once his instrument and the symbol of his authority. *Baton-sinister*, *baston*, *batoon*, or *batune*, is a term used in heraldry to indicate illegitimacy. It is a diminutive of the bend sinister, being one-fourth of its width, and does not extend from side to side of the shield. It came into use in England in the 15th century to mark the illegitimate descendants of the royal family.

Batoni, Pompeo Girolamo, one of the most distinguished painters of the [illegible] born at Lucca [illegible] a goldsmith, and Pompeo had thus an early opportunity of displaying his ability for design. He estab. himself very early in Rome, where he studied Raphael and the antique, and kept himself at first by copying celebrated pictures, but in a few years he obtained the first name in Rome, and lived there until his death, for forty years, without a rival, with the exception of Menge; he died in 1787. B. was equally excellent in portrait and history. Several cities of Italy possess altar-pieces by him, and there are also many of his works in Germany and other foreign countries. Some of his best works are at Lisbon and at St. Petersburg.

Baton Rouge, a city in the United States, the cap. of Louisiana, on the l. b. of the Mississippi. It is situated on a high bluff, and has a college, an arsenal, and a penitentiary. On Aug. 5, 1862, the Confederate forces under Gen. Breckenridge suffered a heavy defeat here. Pop. 11,000.

Batony, a tn. in Hungary, in prov. of Csanad, 25 m. E.N.E. of Mako; pop. 13,000.

Batou Khan (*d.* 1254), Tartar emperor, grandson of Ghengis Khan, ruled over Russia and Bulgaria. He laid waste Hungary, and in 1252 acquired Moscow

Batoum, or Batum, a tn. and port in Transcaucasia, Russia, on the eastern shore of the Black Sea. It was ceded to Russia by the Berlin Congress in 1878, and since that date it has grown in importance, exporting petroleum, lead, cereals, cotton, wool, and fruits. It was a free port until 1886, when its privileges as such were withdrawn. There is railway communication with Baku and Tiflis. B. is also a naval station. Pop. 30,000.

Batrachia (Gk. βατράχειος, frog-like), a term that is frequently used synonymously with the class *Amphibia*, *i.e.* frogs, toads, newts, salamanders, etc., and sometimes with the order *Anura*, which consists of frogs and toads alone.

Batrachomyomachia (Gk. βατράχος, frog, μῦς, mouse, μαχή, battle), a Gk. poem consisting of 294 hexameter verses, which is ascribed to Homer, but attributed by Plutarch and Suidas to Pigres of Halicarnassus. The *Battle of Frogs and Mice* is a parody on the *Iliad*.

Batrachus, an architect and sculptor of Laconia, who lived in the time of Augustus. Pliny tells a story of B. and his fellow-countryman Laurus. He says, 'Being very rich, they built at their own cost two temples to Jupiter and Juno at Rome, enclosed by the porticoes of Octavia, hoping for an inscription; but this being refused them, they introduced their names in another manner, by carving a lizard (Laurus) and a frog (B.) in the centre of the Ionic volutes of the columns, one in each volute' (Pliny *Hist. Nat.* xxxvi. 4, 11).

Batshian, *see* BATCHIAN.

Batta (Canarese *bhatta*, rice in the husk) is the extra money added to the pay of a British officer in India. It varies according to place and circumstances.

Battalion is a tactical and administrative unit of command in infantry. The war-strength of a British B. is 1000, or counting all ranks, 1096. This is the largest number of men that can be properly controlled in action by one commander. Eight companies form a British B., each with a captain and two lieutenants; for tactical purposes four companies form a half B., commanded by a major. A B. is under the command of a lieutenant-colonel, whose regimental staff consists of an adjutant, who may be a lieutenant or a captain; a quartermaster, invariably promoted from the ranks, and ranking as lieutenant or captain; a surgeon, and a paymaster. The band-master and sergeant-major are warrant officers, not holding commissions. Three small-arm ammunition carts, a water-cart, and eight general service waggons for baggage, with forty-five horses, are taken into the field by a B. The number of men in a Prussian B. at

war-strength is 1000 men, divided into four companies; the Austrian and Fr. B. are divided into six companies. A British B. is not normally at war-strength, but is brought up thereto by calling out reserve men.

Battas, Battaks, or Battahs, form a race of people which inhabit the central highlands of Sumatra, from the volcano Ophir northwards as far as Achi. Their national centre is Lake Toba. The B. are akin to the Malay race; some are independent and heathen, whilst some are under Dutch dominion and Mohammedans. The B. till the soil, and grow principally rice and maize; they also keep cattle, horses, goats, and pigs. Their prin. occupation consists in the manuf. of ironwork, earthenware, and cloth. The houses are built of wood, covered in with the ribs of palm-leaves. The villages are fortified after a fashion, being surrounded by earthern walls and bamboo palisades. The people are distinguised by their innate and persistent conservatism, being very unwilling to give up old customs. They are of middle height and light brown in colour, with long black hair. Dirty in their dress and dwelling, they are no more fastidious in their diet, being willing to eat anything, though rice is their staple food; cannibalism is sometimes practised, though to a much less extent than formerly. Peaceful as a rule, the B. have no lack of courage on occasion. They have also a written language and literature.

Batten, the commercial name given to various kinds of sawn timber smaller than a plank, being usually 12 or 14 ft. long, 7 in. broad, and 2½ in. thick. The term is also used in connection with narrow wooden strips used in ship-building.

Battenburg was originally the name of a German aristocratic family, which became extinct about 1314. The seat of the family was near B., a small place in the Prussian prov. of Hesse-Nassau. In 1851, Alexander, the younger son of Louis II. of Hesse, married morganatically the Polish Countess Julia Theresa von Haucke, who was then created Countess of B. In 1858 she was given the rank of princess, and her children were permitted to call themselves Princes and Princesses of B. The eldest son of the marriage, Louis Alexander, was born in 1854. He married Victoria, daughter of Louis IV. in 1884, and subsequently became a British admiral. The second son, Alexander Joseph, was Prince of Bulgaria from 1879 to 1886, and died in 1893. The third son, Henry Maurice, was born in 1858, and married Beatrice, youngest daughter of Queen Victoria, in 1885. He died in 1896, when returning from service with the British troops in the Ashanti war. (Victoria Eugénie, who married King Alphonso XIII. of Spain in 1906, is the daughter of Henry Maurice of B., who had three other children, all sons.) The only daughter, Marie Caroline, was born in 1852, and married Gustavus Ernest, Prince of Erbach-Schonberg, in 1871. The fourth son, Francis Joseph, was born in 1861, and married the daughter of Nicolas I. of Montenegro in 1897.

Batter, in architecture, is used of the wall of a building which recedes as it rises, so that the B.-rule, or plumb-line, falls within the base. The walls of wharves usually batter.

Battering-ram was an engine employed in ancient times to cause a breach in the walls of a besieged place. Two kinds of Bs. were used, one kind being suspended in a frame, the other movable on wheels or rollers. The ram consisted of a large beam, or spar, with a massive metal head; it was usually set in motion by means of cords passing over pulleys. A roof or screen to protect those employing it generally covered it. Bs. were often made of very great weight and size.

Battersea is a south-western suburb of London, on the Surrey side of the Thames, spanned near here by the Chelsea, Albert, and B. bridges. B. Park, which was commenced in 1852, has an area of 185 ac., and the Albert Palace opened in 1885 is also in B. Of late years the suburb has been markedly democratic in its views. Many factories, foundries, and engineering works are in the suburb, and the Shaftesbury Park Estate provides houses for many of the working classes. Lord Bolingbroke was born in B., and here the Duke of Wellington fought a duel with Lord Winchelsea in 1829. A metropolitan municipal borough of the co. of London, B. sends two members to parliament, and has a pop. of 270,000.

Battersea, Cyril Flower, First Baron (1843-1907), an Eng. politician, born at Streatham and educated at Harrow and Trinity College, Cambridge. He entered parliament in 1880, representing first Brecknock, 1880-5, and afterwards S. Bedfordshire, 1885-92. He was Junior Lord of the Treasury, under Gladstone, in 1892, and was created a peer in the same year.

Battery, *see* ARMY and ARTILLERY.

Battery, Assault and, *see* ASSAULT AND BATTERY.

Battery, Electrical, *see* ELECTRICAL BATTERY.

Batthyanyi is the name of one of the most ancient and distinguished of the Hungarian aristocratic families. Its family-tree goes back to A.D. 884, and it has numbered among its members some of the most illustrious men of

Hungary. In 1526 Francis B. distinguished himself in the battle of Mohacz, and Balthazar B. in the Turkish wars of the same century. Count Casimir B., born in 1807, was minister of foreign affairs in Hungary during the insurrection of 1849. After the disaster of Vilayos he fled with Kossuth into Turkish ter., and afterwards he went to Paris, where he died in 1854. Count Louis B. was born at Presburg in 1806, and entered the army as a cadet, but subsequently adopted a diplomatic career. He was appointed president of the ministry when Hungary at length obtained one in 1848, but did not hold the office long. Despite his moderation as a member of the diet, he was arrested in Jan. 1849, when the Austrians entered Pesth. He was condemned to be hanged on Oct. 6, 1849, but by wounding his neck with a dagger he prevented this form of execution being carried out. He was, however, shot.

Battiadæ, a Cyrene dynasty of eight kings. They were: Battus I. (*c.*630 B.C.), Arcesilaus I., Battus II., Arcesilaus II., Battus III., Arcesilaus III., Battus IV., and Arcesilaus IV. (*d.* about 450 B.C.). The last-named is the subject of two of Pindar's odes. The history of the dynasty may be found chiefly in Herodotus.

Batticaloa, a tn. of Ceylon, cap. of dist. of same name, situated on a small is. off the E. coast. It has an excellent harbour and a good trade, particularly in cocoanut products. Area of dist. 13,060 sq. m.; pop. of dist. 36,000, of tn. 7300.

Battle, a mrkt. tn. and parish in the co. of Sussex, situated 6 m. N.W. of Hastings. It was anciently called Epiton, but after the battle of Hastings in 1066, which was fought near here, its name was changed to B. It contains the ruins of B. Abbey, built by William I. on the spot where King Harold was killed. Pop. about 3500.

Battle, a fight between two or more armies or navies, whether large or small. At Sadowa 400,000 men were engaged, at Naseby only 21,000, but each was a decisive contest. A B. is termed *general* when both armies are brought fully into action; if only a considerable portion of each it is *partial*. When only small sections are engaged it is called a skirmish. A commander may choose to act on the offensive or defensive, or to combine both, according to circumstances; judgment in decision, skill in preparing the plan of B., and promptness in varying it as required, are the marks of a great leader.

Striking illustrations of the influence which a great B. may have on more than merely national fate will be found in Sir Edward Creasy's *Fifteen Decisive Battles*, and a clear analysis of the principles of modern warfare in Sir Edward Hamley's *Operations of War*. Of Bs. which have produced the greatest results in history the following may be specially noted: Marathon (490 B.C.), Chalons (A.D. 451), Tours (732), Hastings (1066), Spanish Armada (1588), Trafalgar (1805), Waterloo (1815), Sedan (1870), Tsu-shima (1905), and Lule Burgas (1912). The most sanguinary Bs. of recent times were: Borodino (1812), when out of 250,000 men engaged 80,000 were killed and wounded; and Mukden (1905), in which each army had over 300,000 soldiers engaged and the fighting lasted over a fortnight, the Japanese losing nearly 50,000, and the Russians over 90,000. At the B. of Lule Burgas (1912) the Turks lost over 40,000 and the Bulgarians 15,000.

Battle, Wager of, *see* TRIAL BY COMBAT.

Battle Abbey, The Roll of, a list of the barons who fought on the side of William I. at the battle of Hastings. It is supposed that at the end of the battle a list was made of his chiefs, who numbered 629, and among whom the titles and property of the defeated were distributed. The Duchess of Cleveland edited *The Roll of Battle Abbey*, with notes, etc., in 3 vols., 1889. Consult also Walcott, *History of Battle Abbey*, 1867.

Battle-axe is a weapon which has been in use from primitive times. The head was originally made of stone, then of bronze, and finally of iron or steel; some varieties could be held with one hand, while others required two. The pole-axe, or halberd, is merely a B. with a long handle.

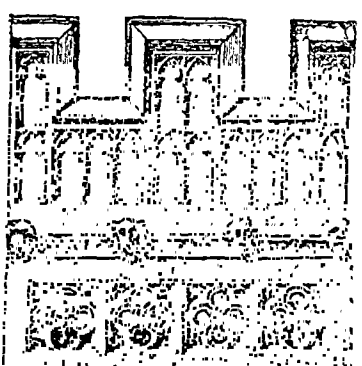
Battle Creek, a city in Calhoun co., in the S.W. of Michigan, U.S.A., is on the Kalamazoo R., 48 m. from Grand Rapids. It was settled in 1831, and became a city in 1859. Lying in the centre of a rich fruit and grain producing district, it is chiefly famous for the manuf. of health foods, in which it takes the lead in the States; but it has also large works for making agric. implements, railway cars and locomotives, and pumping engines, besides a fine medical college and sanatorium. Pop. nearly 30,000.

Battledore and Shuttlecock, a game played 2000 years ago in China, and still popular. It consists of tossing the shuttlecock, a cork base surrounded by feathers with parchment rackets.

Battleford, a tn at the confluence of the Battle and N. Saskatchewan Rs., Canada. From 1876 to 1883 it was the seat of government for the N.W

Territories, but was then superseded by Regina. Fighting took place here during Riel's insurrection in 1885. A branch railway connects B. with the Canadian Pacific.

Battlement (Fr. *bâtiment*, building), a wall erected round the top of a fortified building consisting of rising parts known as *cops* or *merlons*, and intervening spaces called *crenelles*.



BATTLEMENT

The soldiers fired from the embrasure while taking refuge behind the merlon. In architecture Bs. are still erected for artistic effect.

Battue (from Fr. *battre*, to beat), a method of killing game, such as hares, pheasants, etc., by having them driven out of cover by beaters towards the spots where sportsmen are stationed to fire. In war or civil strife the term has often been applied to the slaughter of helpless crowds.

Batum, *see* BATOUM.

Baturin, a tn. of Tchernigov gov., Russia, on R. Seim, 63 m. E. of Tchernigov. From 1669-1708 it was the headquarters of the Hetman of the Ukraine Cossacks. Pop. 3600.

Batz, a tn., dept. Loire-Inférieure, France, situated on the coast, 50 m. N.W. of Nantes. It has salt-pans and interesting antiquities, and the inhabitants are noted for their quaint customs and picturesque costumes. Pop. 2500.

Baucis, *see* PHILEMON.

Baud, a tn., dept. Morbihan, France, 13 miles S. of Pontivy; pop. 4690.

Baudelaire, Charles Pierre (1821-67), Fr. poet and littérateur, was born in Paris, and educated there and at Lyons. At the age of twenty he was leading such a riotous life that his guardians sent him away to India, but he soon returned and became prominent among the Bohemians and revolutionaries of Paris. As an author he belonged to the most exaggerated and unwholesome section of the romanticists. Though his work has high artistic merit, yet his subjects and treatment reveal a taste for disagreeable, even loathsome, matter, and a rebellion against the accepted canons of morality and society. His earliest poems, *Les Fleurs de Mal*, both in title and matter, foretokened his literary career. His is the art of presenting passion and vice in daring and brilliant colours, and clothing horrible and abominable ideas in exquisite language. But not all his work was like this; he was an excellent critic, and his translations from the writings of Edgar Allan Poe are perfect. The latter part of his life was miserable. Financial troubles, opium, and drink ruined his health, and his last two years were spent in private hospitals. His chief works are: *Les Fleurs de Mal*, *Poèmes en Prose*, translations from Poe, and some vols. of critical essays.

Baudin, Charles (1784–1854), Fr. admiral, fought in the Napoleonic wars. In 1838 he distinguished himself by the capture of St. Jean d'Ulloa, and was appointed minister of the marine in 1841.

Baudissin, Wolf Heinrich von (1789-1878), Ger. writer, was for some time secretary to the embassy at Vienna, and later at Paris. Afterwards, however, he gave all his time to the study of literature. He did into modern Ger. much of the primitive writings of his people, but his countrymen are especially indebted to him for his translations of the plays of Shakespeare and other Elizabethan dramatists, of Molière, and Goldoni, besides an excellent and original work on *Ben Jonson and his School*.

Baudrillart, Henri Joseph (1821–94), Fr. economist, son of J. J. B. His contributions to the *Journal of Economists*, etc., prove him to be a gifted man of letters. As a member of the Academy of Moral and Political Science he was entrusted with an inquiry, the results of which were pub. in his *Agricultural Population of France*. He was professor of political economy at the Ecole des Ponts et Chaussées.

Baudrillart, Jacques Joseph (1774-1832), French authority on forestry, was the son of a market gardener. In 1819 he occupied a position of importance in the administration of forests, and later published many books dealing with forestry.

Baudry, Paul Jacques Aimé (1828-86), Fr. painter, *b.* in Vendée. He won the Prix de Rome in 1850, and his residence in Italy strongly influenced his afterwork. His favourite subjects

were mythological or decorative, but he painted one historical picture ('Charlotte Corday after the death of Marat'), and many excellent portraits. His greatest fame was gained by his mural decorations in the Paris Opera House, the Château de Chantilly, the Cour de Cassation, and various private houses. His works are marked by graceful design and rich colouring rather than by strength or originality.

Bauer, Bruno (1809–82), theologian and historian, was born at Eisenburg, Germany, and educated at Berlin, where he became a licentiate of theology in 1834. In 1839 he was transferred to Bonn, but within the next two years published works on the Gospels expressing such unorthodox views that his licence to teach was withdrawn, and he retired to Rixdorf to spend the rest of his life in study and authorship. His theories on the origins of the Gospels are, briefly, that 'St. Mark' was written in the time of Hadrian, and that from this the others were constructed a century later by Gentile converts, who then passed them off as genuine apostolical documents. He also disputes the authenticity of the four chief Pauline epistles. His assertions, though not well received, had the good effect of causing fuller inquiry into the history and character of early Christian records. B. also wrote histories of the 18th century, and of the French Revolution.

Bauer, Caroline (1807–78), a Ger. actress, was born at Heidelberg. She made her début in 1822, and became a popular favourite both in comedy and tragedy. In 1829 she was married morganatically to Prince Leopold of Coburg, then widower of the Princess Charlotte and afterwards King of the Belgians. Their union was unhappy, and came to an end in 1830. Returning to the stage for some years, she finally left it in 1844 to marry a Polish count. She wrote two lively vols. of theatrical reminiscences and memoirs, published posthumously, in which she strongly denounced Prince Leopold and Baron Stockmar.

Bauernfeld, Eduard von (1802–90), Austrian dramatist, was *b.* at Vienna. In his numerous plays the dialogue always flows, and the interest is well maintained. Though he is not interested in profound psychology, his irrepressible humour, and his lively sense of the ridiculous both in circumstances and people, make him the Molière of the Viennese stage. *Leichtsinn aus Liebe, Bürgerlich und Romantisch, Das Liebes Protokoll*, and *Moderne Jugend*, are the best known of his comedies.

Baugé, a tn., dept. Maine-et-Loire, France, on R. Couasnon, 23 m. N.E. of Angers. The cap. of an arron. The Fr. defeated the British under the Duke of Clarence here in 1421. Pop. 3325.

Bauhin, Gaspard (1560–1624), brother of Jean B., was born at Basel. After receiving the usual college education, he visited sev. parts of Europe. On his return to Basel, he appears to have gained great reputation as a learned man and a skilful naturalist. We find him described as holding the offices of professor of Gk., of anatomy and botany, and of the practice of medicine, dean of the faculty of medicine, chief physician to the town, and rector of the university. His chief works were: *Phytopinax*, Basel, 4to, 1596, and *Prodromus Theatri Botanici*, Frankfurt, 1620. He also made collections of the synonyms of the botanical writers who had preceded him. The latter appeared in his *Pinax Theatri Botanici* in 1623, of which a second edition was published in 1671, forming a complete key to the botanical knowledge of the day.

Bauhin, Jean (1541–1613), was, according to Sprengel, born at Basel. His father placed him with Fuchsius, a botanist of eminence, and afterwards with Conrad Gesner, whom he accompanied in various excursions through Switzerland. He afterwards visited several other parts of Europe for the purpose of becoming acquainted with their vegetable productions, and with a view to collecting materials for his *Historia Plantarium*, afterwards pub. In 1566 he fixed himself at Basel, where he was elected professor of rhetoric. A few years subsequently he was appointed principal physician to the Duke of Würtemberg, in which situation he died at Montbéliard.

Bauhinia, a large genus of tropical Leguminosæ named by Linnæus after the two botanists, Bauhin. The flowers are often very beautiful, the leaves are generally divided into twin lobes, but the genus is chiefly remarkable for its twining plants which twist in and out in an intricate manner. *B. porruta*, the Jamaica 'mountain ebony,' is so called because its wood is sheathed in black.

Baukaw, or Baukau, a tn. of Prussia, in circle of Bochum. Coal mines. Pop. about 8000.

Baul, a tn. of Venezuela, in state of Zamora, 60 m. S. of San Carlos; pop. 10,000.

Baumann, Oskar (1864–99), Austrian traveller, born in Vienna; in 1885 journeyed with Leng up the Congo river to Stanley Falls; the following year he explored Fernando Po, and two years later ascended the mt. of Kilimanjaro. During 1892-93 he led an expedition to Victoria Nyanza

and explored the surrounding dist.; in 1896 he was made consul at Zanzibar. He published sev. works on his explorations, of which three are *Eine afrikanische Tropen-Insel, Fernando Poo*, 1888; *Usambara und seine Nachbargebiete*, 1891; and *Afrikanische Skizzen*, 1900. *See* M. Haberlandt's *Dr. Oskar Baumann*, 1900.

Baumannshöhle, stalactitic cavern in Harz Mts., Duchy of Brunswick, on Bode R., 5 m. S.E. of Blankenburg. It contains numerous fossil remains.

Baumbach, Rudolf (1840–1905), Ger. poet and novelist, was born at Kranichfeld. Among his best works are the epic, *Zlatorog*, 1875; the novel *Trug-Gold*, 1878; book of lyrics, *Lieder eines fahrenden Gesellen*, 1878; and fairy-story, *Es war einmal*, 1889.

Baume-les-Dames, tn., dept. Doubs, France, on R. Doubs, 18 m. N.E. Besançon; cap. of an arron.; pop. 3000.

Baume-les-Messieurs, a vil. in Jura dept., France, 6 m. N.W. of Lons-le-Saulnier.

Baumgarten, Alexander Gottlieb (1714-62), was *b.* at Berlin. He studied at Halle, and became a warm admirer of Wolff's philosophy. B. applied himself to logic and to *belles-lettres*, on which he afterwards gave lectures at the Orphan Institution of Halle. He invented the word æsthetics, which applied to the theory of taste, or science of the beautiful. He divid[illegible] the science of æsthetics into theoretical and practical; he developed his ideas first in his treatise, *Disput[illegible]*

distinct science [illegible] in the German works of B. ar *Philosophica, Practicæ*. In 1740 B. was appointed professor of philosophy at Frankfurt-on-the-Oder, where he died.

Baumgarten-Crusius, Ludwig Friedrich Otto (1788- was born at Mer Leipzig University. From 1812 until his death he was professor of theology at Jena. He was a recognised authority on the history of Christian dogma, and his books on the subject are numerous, among the chief of them being *Grundzüge der Biblischen Theologie*, 1828, and *Compendium der Dogmengeschichte*, published four years after his death.

Baumgärtner, Andreas, Baron von (1793-1865), an Austrian scientist and politician, was born at Friedberg, Bohemia, and studied at the University of Vienna, where he became professor of physics. He was afterwards appointed director of the imperial porcelain factories, 1833-46; in charge of railway construction, 1847; of public works, 1848; minister of commerce, 1851; and of finance, 1851. In 1855 he was president of the Austrian Academy of Sciences, and in 1861 entered the Reichsrath, House of Lords. He pub. *Die mechanische Theorie der Wärme*, 1864; *Naturlehre*, 1823 (new edition 1845), and many other works.

Baumgärtner, Gallus Jakob (1797-1869), a Swiss statesman, born at Altstätten. He studied at Freiburg and Vienna, and promoted the revision of the constitution of the cantons, 1831. He was a leader of the Liberals till 1841, when he joined the Ultramontane party. He represented his canton in the Council of Estates from 1857 to 1860. His writings are on historical subjects and include: *Die Schweiz in ihren Kämpfen und Umgestaltungen von* 1830-50, 4 vols., 1853-66. In 1842 he founded the *Neue Schweizer Zeitung*.

Baumgärtner, Karl Heinrich (1798-1886), a Ger. physician, born at Pforzheim, and died at Baden-Baden; he became clinical professor at Freiburg, 1824-62. His fame rested on his original studies in embryology and the circulation of blood. He wrote voluminously on medical subjects; [illegible] *Nähere Begründung Embryoanlage durch* 1854; *Schöpfungsgedanken*, 1856-9.

Baur, Ferdinand Christian (1792-1860), Ger. theologian, *b.* near Stuttgart. In 1825, while professor in the theological seminary at Blaubeuren, he published his first important book, *Symbolik und Mythologie oder die Naturreligion des Altertums*. Next year he was appointed professor of theology at Tübingen, where for some time he wrote [illegible] and allied subjec *Religionssystem Apollonius von* meanwhile he w influence of Heg of history he adopted in his subsequent works. Between 1835 and 1847 he estab. what is known as the 'Tübingen School,' the teachings of which were so opposed to orthodox tradition that they aroused great antagonism. B. contends that the various N.T. books were mostly the outcome of a Petrine *versus* Pauline contest in the early Church, that the only genuine epistles of St. Paul are those to the Galatians, Corinthians, and Romans, and that these prove him to have been in strong opposition to Peter, while the writer of Acts tried as far as possible to minimise their disagreement. B. also argues in his book on the Gospels (1847), that

these, written in the first and second centuries, were adaptations from an earlier gospel, and show a desire on the part of the redactors to reconcile the opposing factions. His main argument is that Peter and his friends tried to establish a Jewish Christianity, while Paul worked on bolder and broader lines, and that their differences influenced all Christian literature for two centuries. Towards the end of his life, B. somewhat modified his views, and hi [illegible] (1835-63) is less [illegible] strictly historical [illegible] works.

Bautain, Louis Eugene Marie (1796-1867), was born at Paris and educated at the Ecole Normale. Displaying a talent for philosophy, he became professor of that science at Strassburg, where he was afterwards appointed professor also of literature. In 1828 he resigned his professorship to take orders, but remained in Strassburg until 1849, when he was translated to Paris as vicar of the diocese, and remained there until his death. His philosophy and theology were rather mediæval than modern; he was a mystic, and strongly opposed to rationalism.

Bautzen, or Budissin, a tn. of Upper Lusatia, Saxony, Germany, on R. Spree, 31 m. N.E. of Dresden. The cap. of an administrative dist. It is surrounded by picturesque turreted walls, and contains a cathedral. Has manufs. of textiles, leather, paper, and metal. Napoleon defeated the Allies here in May 1813. Pop. 29,000.

Bauxite, an earthy compound of aluminium, iron oxide, titanic acid, and water, in varying proportions; found in the S. of France (taking its name from Baux, near Arles), in Ireland (Antrim), and in the Southern United States. Its colour varies according to the proportion of oxide. B. is valuable for the production of aluminium and its salts. As it resists heat well it makes also good crucibles and fire-bricks.

Bavaria (Ger. Bayern), one of the kingdoms of Southern Germany and in area and pop. the state which next to Prussia is of most importance in the Ger. empire. It is divided into two unequal parts, the one B. proper, which occupies at least eleven-twelfths of the whole area, and the other the Palatinate of the Rhine, which is divided from B. proper by the duchies of Baden and Hesse. B. proper is surrounded by great ranges of mts. on three sides, the western side being bounded by Würtemburg, Baden, and Hesse. The country consists mainly of an extensive plateau, which has an average height of nearly 2500 ft. It belongs principally to the basins of the Danube and the Main, the most important river being the former. The Danube follows a winding course of about 200 m. long throughout B. It is navigable, and receives during its course through B. numerous tributaries, amongst which may be named the Iller, the Lech, the Isar, and the Inn, the Naab and the Wörnitz. The Palatinate is bounded on the N. and W. by a lofty range of hills, on the E. by the Rhine, and on the S. by Alsace. The climate of B. varies very considerably with the physical character of the country. Taken on an average, it is rather colder in winter than in Great Britain, but a good deal warmer during the summer and the autumn. The area of the two divisions taken together is 29,285 sq. m. It is divided into eight provs.: Upper B., Lower B., Upper Palatinate, Upper Franconia, Middle Franconia, Lower Franconia, Swabia, and the Palatinate. The pop. of B., according to the census of 1905, was over 6,500,000. Two of the tns. have pops. of over 100,000, while another four have pops. between 50,000 and 100,000. Education, which up till quite recently was rather backward, has improved very considerably of late years. There are now at least two Roman Catholic universities. By far the greater part of the pop.—almost three-fourths—are Roman Catholics. By a concordat with Rome the kingdom is divided up into two archbishoprics and six bishoprics. The Protestant Church, however, is supported by the state, and the Protestants form nearly one-fourth of the population, the remainder consisting principally of Jews.

Agriculture.—The main products of the country are rye, oats, wheat, barley, and millet, hemp, flax, fruit, and the vine. Tobacco is also produced in some quantities, and the Palatinate produces large quantities of the sugar beet. In Central Franconia extensive quantities of hops are produced. In the provinces of Swabia and Upper Bavaria, cattle-rearing forms the chief occupation of the people, the country here being more suited to pasture land than for the production of good crops. Almost one-third of the whole area of Bavaria is given up to forest lands. The land is held principally by peasant proprietors, the average holding consisting of about 150 ac.

Mineral wealth.—The chief minerals of B. are coal, iron-ore, graphite, and salt. Up to the middle of the 19th century the sale of the latter was a gov. monopoly, but this monopoly has been abolished during the last sixty years. Coal is found in almost all parts of B. In addition may be

mentioned quarries of marble, gypsum, and good building stone. In the Palatinate there are also sev. quicksilver mines which still produce a good output. Porcelain clay is also found, and ranks amongst the finest in Europe.

Manufactures.—The chief industry of B. is brewing. This industry is carried on on a far more extensive scale here than in any other European country. There are considerably more than 5000 breweries in the country, and the output of beer is more than 100,000,000 gallons per annum, the greater part of the output being consumed within the country itself. In addition, there is a fair porcelain industry, and a good industry in cotton and woollen goods. Hardware, wooden toys, glass, cement, and spirits are also manufactured in the country. The chief exports are corn, hops, beer, wine, and potatoes. Nuremburg is the centre of the hop trade, and Augsburg the chief of the cotton tns. Sugar, tobacco, cocoa, and coffee are imported into the country. The communications of the country are in a good state; there are excellent state railways, a good system of roads, and a fair canal system. Telegraphic and telephonic communications are also good.

Constitution.—By the Treaty of Versailles of 1871, B. became one of the confederated states in the Ger. empire, which, however, reserved to B. many separate privileges. By the constitution of 1818, which has been only slightly altered, B. is a constitutional monarchy. The crown descends to the nearest male heir, and is hereditary in the house of Wittelsbach. In case of infancy or incapacity the regency is vested in the nearest male heir to the throne. The king is the head of the executive, but his ministers are responsible for his acts. The seat of the gov. is at Munich. Bavaria also sends forty-eight deputies to the imperial diet. The army forms a separate portion of the Ger. army, but in time of war is commanded by the Ger. Emperor. Its peace footing is about 60,000 men, in war time this number can be raised to nearly 200,000.

History.—The original inhab. of B. were probably of Celtic origin, and had probably been in occupation of their ter. for some centuries before. Just previous to the beginning of the Christian era they were conquered by the Romans and included in a Rom. prov. After the decline of the Rom. power they suffered somewhat from the inroads of the barbarians, and were ultimately quite easily conquered by the Franks. Their dukes, during the later part of the dark ages, seem to have been completely under the control of the Frankish kings and emperors. By Charles the Great, B. was definitely incorporated in the Carolingian empire. During the centuries which followed, B. was the scene and the cause of many quarrels, being held now by one prince, now by another, until towards the end of the 11th century it passed into the hands of the family of Welf. The first Welf with difficulty retained it, and passed it on to his sons, but his grandson, holding both B. and Saxony, was deprived of B., which for a short time passed back into the hands of the imperial family, only, however, until 1156, when it was restored to Henry the Lion, the great-grandson of the first Welf. But Henry the Lion did not hold the duchy for very long; in 1180 he was placed under the imperial ban, and deprived of his lands, which were given to a duke of the Wittelsbach family. Under the early Wittelsbachs B. increased in prosperity, but its means of territorial expansion were rapidly declining, since on all sides were growing up strong and extensive powers. During the 13th and 14th centuries the possibility of B. becoming one of the great Ger. powers was stopped by the div. of the duchy into two, and again after a short union into six. For some considerable time the history of B. is simply the record of the innumerable quarrels and wars which were the natural outcome of these divs., and B., as a Ger. duchy, ceased to be of any great importance. Until the beginning of the 16th century B. remained disunited, until in 1504 it again regained its unity under Albert the Wise. After his death, again a partial div. took place between his sons, William IV. and Louis; after Louis' death, 1545, William IV. again ruled over a united B. The next important point to be noticed in the history of B. is its attitude towards the Reformers. William IV. keenly supported the Catholic Church, and was able to a very great extent to repress the progress of the Reformers. His son followed his policy, and was succeeded by William the Pious, who had been trained by the Jesuits. His son, Maximilian I., placed B. on a very strong basis indeed, reformed it internally, took an active part in the Thirty Years' War, and regained for his country the addition of the Upper Palatinate. He died in 1681, leaving B strong, able, and desirous of taking her proper place in the councils of Europe, a thing which internal strife had forbidden during the past four centuries. In addition to keeping this ter. at the peace of Westphalia it, in addition, received confirmation of

its title to the electoral dignity to which it had been raised in 1624. The next reign was taken up in a judicious attempt to allow the duchy to recover from its exhaustion brought on by the Thirty Years' War. Under Maximilian's son this work was well carried out, but Maximilian Emmanuel undid all this work by taking an active part on the side of France during the Spanish Succession War and sharing in the defeat at Blenheim in 1704. His dominions, lost for the time, were only restored in 1714 in a very ravaged and exhausted condition. On the death of the Emperor Charles VI., untaught by the experience of 1702-14, Charles Albert devoted all his strength and power to an attempt to win from Maria Theresa the crown of Austria. Semi-successful at first, he *d.* in the midst of failure (1745), and his successor got back the ancestral possessions only by giving [illegible] of the short [illegible] tempt to recover. And in 1777, on the extinction of the Bavarian line of the Wittelsbachs the succession passed to the Elector Palatine (Charles Theodore), and the Palatinate and the duchies of Julich and Berg were united to B. This directly led to the war of the Bavarian succession. The revolutionary wars found B. a prey to the alternate attacks of France and Austria. In 1805, however, B. was made into a kingdom by Napoleon, the title being vested in the ducal elector. B. now remained a firm ally of Napoleon until 1813, when, by a judicious change of sides, it was able to have confirmed to it by the victorious allies all the benefits and advantages given it previously by Napoleon. In 1818 it received another constitution, one which it holds to the present day with practically no change. B. felt the shock of the Revolution of 1830, but no outbreak took place until the further shock of 1848. The king was then forced to abdicate, and was succeeded by his son. During the Austrian-Prussian War, B. helped Austria, and had to pay a huge indemnity at the end of the war to Prussia, and concede some small amount of ter. In 1870, however, it placed its army under the command of the Prussians, and by the treaty of Versailles of 1871 became an integral part of the German empire with certain special privileges. King Louis II., the patron of Wagner, went mad, and committed suicide in 1886, being succeeded by his brother, King Otto, who also unfortunately became insane; the regent appointed was Prince Leopold, his uncle.

Bavaria, Statue of, a colossal bronze statue, personifying Bavaria, executed by Ludwig von Schwanthaler, 1802-48, which stands nearly 63 ft. high in front of the Ruhmeshalle at Munich.

Bavarian Alps, *see* TYROL.

Bavay, a tn., dept. Nord, France, 13 m. S.E. of Valenciennes. The ancient Bagacum, cap. of the Nervii. It has iron-works and marble quarries. Pop. 1750.

Bawean, Bawian, or Bavian Island, an is. off the Malay Peninsula, situated between Borneo and Java. The dist. is hilly with fertile valleys and hot springs; it is very densely populated and is a Dutch possession. Pop. about 35,000.

Bawtry, a tn. of W. Riding, Yorkshire, England, 8 m. S.E. of Doncaster, on the Great Northern Railway; pop. 1000.

Bax, Ernest Belfort, an Eng. journalist, *b.* 1854 at Leamington. He studied philosophy in Germany where he acted as a foreign correspondent during 1880 and 1881. In 1885 he was the co-founder with William Morris of the Socialist League, and for a time assisted in the editing of the *Commonweal.* He later joined the Social Democratic Federation, and became the editor of its organ, *Justice.* He is the author of numerous works on historical and socialistic subjects, which include *Jean Paul Marat,* 1878; new ed. 1901; *Ethics of Socialism,* 1889; *French Revolution,* 1890; *German Society at the Close of the Middle Ages,* 1894; in conjunction with William Morris, *Socialism, its Growth and Outcome,* 1894; *The Peasants' War in Germany,* 1899; *Essays in Socialism,* 1906; *The Last Episode of the French Revolution,* 1911.

Baxar, or Buxar, a tn. situated on the S. bank of the Ganges in the Shahabad dist., Bengal, India. Here Mir Kasim was defeated by Sir Hector Munro, 1764. It is of literary interest as the residence of writers of Vedic hymns. The trade is chiefly in sugar, cotton, and cotton goods. Pop. 14,000.

Baxter, Sir David (1793-1872). He was manager of the Sugar Refining Company, in Dundee, till 1826, when he joined the linen manufacturing firm of Baxter Brothers as a partner. He was extremely successful in business, and was a most generous benefactor to his native town. He was created a baronet in 1863. Consult Norrie, *Dundee Celebrities of the Nineteenth Century,* 1873.

Baxter, Richard (1615-91), divine and controversialist, *b.* at Rowton in Shropshire, and studied under Richard Wickstead, who had an excellent

library, though a careless scholar himself. B.'s ambition to attend a university was not realised. Tried his fortune at court, where he was well received, but he found the life unsuitable. Ordained at the age of twenty-one by the Bishop of Worcester; appointed to the Grammar School at Dudley; became assistant to a clergyman at Bridgenorth; went as preacher to Kidderminster. While siding with the Parliamentarians in the Civil War (he accepted a chaplaincy to the Parliamentary army), he opposed the execution of the king and the vesting of supreme power in Cromwell. He held a middle course between the Episcopalians and Presbyterians. On the restoration of the monarchy he was appointed one of the king's chaplains. He presented to the Conference at the Savoy a reformed liturgy, but neither the Presbyterians nor the bishops would accept it. The Act of Uniformity of 1662 was so strict in its requisitions as regards ceremonial worship that it had the effect of banishing B., with some two thousand divines, from the pale of the church. He retired to Acton, but after the Indulgence of 1672 he returned to London, but was regarded with suspicion. He was arrested as being hostile to Episcopacy, severely fined by Judge Jefferies, and spent eighteen months in prison. During the later years of his life he wrote very much, the number of his writings reaching a total of 168 works. He was an eloquent preacher and a keen and able controversialist. Among his best known works are: *The Saints' Everlasting Rest*, 1650; a *Call to the Unconverted*, 1657; *Methodus Theologiæ*, 1681; *Catholic Theology*, 1675. He left an autobiography, *Reliquiæ Baxterianæ*—a favourite work with Johnson and Coleridge. Orme prefixed a Life to his edition of B.'s works in 23 vols. 1830; Lives by A. D. Grosart (1879), Dean Boyle (1883), and J. H. Davies (1886).

Baxter, William (1650–1723), [illegible]an, ub. um He

Baxterians, a name formerly applied to the followers of Richard Baxter, the Nonconformist divine, in his theological teaching. His two most noted adherents were Dr. Philip Doddridge and Dr. Isaac Watts.

Bay is a name applied to several species of the genus *Laurus*, or laurels, and also to plants which somewhat resemble laurels. The sweet B. is the *Laurus nobilis*, an evergreen plant which grows abundantly in S. Europe, and was used as the victor's laurel of olden times. The aromatic leaves are used for culinary purposes, and the berries for veterinary medicine. Red B., or *Laurus Carolinicnsis;* white B., or *Magnolia glauca;* loblolly B., or *Gordonia Lasianthus*, are all natives of N. America.

Bay (Fr. *bayer*, to gape) is an inlet of the sea that is wider towards the open sea and narrower as it advances into the mainland. The term is often used where *gulf* would be more appropriate, a gulf being deeper and less variable in width than a bay.

Baya, or *Ploceus baya*, one of the weaver-birds common to India and Ceylon; it belongs to the family Ploceidæ. The weaver-bird is so called from its elaborately-woven nest.

Bayadere (Portuguese *bailadeira*, female dancer) is the name given to the trained dancing girls of India, the *nautch* girls. They are usually selected from the lowest class of the people, and their dancing has a decidedly immoral tendency. Some of the pantomimic dancers are attached to the Hindu temples.

Bayamo, or San Salvador, a city on the R. Cauto, in the S.E. of Cuba, founded by D. Velazquez in 1513. Once the prin. city in the is., its trade was greatly restricted by the choking up of the river by a flood in 1616; it has also suffered greatly from war. Present pop. about 4000.

Bayana, or Biana, a tn. of Rajputana, India, formerly a famous fort, which still contains ruins of ancient times; pop. 9000.

Bayan-Khara Mts., the Mongol name of an extensive range in Eastern Asia. The dist. is still little explored by Europeans, and the existence of these mts. was long only known from Chinese geographers, according to whom they lie in the centre of the E. Asian table-land, W. of Lake Khookhoo-nor, between 35° and 38° N. lat. and 96° and 100° E. long.

Bayard, the famous horse of the four sons of Aymon; he appears in Tasso's *Rinaldo*, *Orlando Furioso*, and *Orlando Innamorato;* the name is also given to a horse in Scott's *Lady of the Lake*, and is frequently applied to any spirited horse.

Bayard, Pierre du Terrail, known by the honourable appellation 'le bon chevalier, *sans peur et sans reproche*' (the good knight, without fear and without reproach) (1475-1524), born at the Château de B. in Dauphiné, of a great military family; placed as a youth in the household of the Duke of Savoy; 1494 accompanied Charles VIII. against Naples and distinguished himself at the battle of Fornovo; served in the Italian wars of Louis XII.; present at the Battle

of the Spurs. where he was taken prisoner; knighted by Francis I. after the battle of Marignano, 1515; mortally wounded when defending Bonnivet against an army of Charles V.

Bayard, Thomas Francis (1828–98), an American statesman. He was *b.* in Wilmington, Delaware, and entered a commercial house in New York as a clerk; in 1848 he began to study law, and was called to the bar in 1851; he was a senator from 1869 to 1885, and became Secretary of State, 1885-9. He was the leader of the Democratic party in the senate, and was many times proposed as president. He was U.S. ambas. to Great Britain, 1893-7. *See* Edward Spencer, *Public Life and Services of Thomas F. Bayard*, 1880.

Bayazid, a tn. of Turkish Armenia, near the Persian frontier and Mt. Ararat, 155 m. N.W. of Tabriz. The cap. of the sanjak of the same name. Pop. 2000.

Bayazid I., surnamed Ildirim (or Lightning) (1389-1403), born 1347, son of Murad I., Sultan of the Ottomans; spent his life in wars against the nations around the Ottoman empire; made great conquests in Servia, Moldavia, Greece, and Hungary; 1397 captured Athens. Conquered and taken prisoner by Timur, Khan of the Tartars. Died in captivity, and was succeeded by his son, Mohammed I.

Bayazid II. (1481–1512), *b.* 1447, son of Sultan Mohammed II., defeated his brother (who contested the throne) at the battle of Yenishehr, 1481. He warred against the republic of Venice, the Sultan of Egypt, and Persia; he concluded treaties with Poland and the Czar of Moscow. Towards the end of his reign his sons rose against him, and the youngest, Selim, supported by the Janissaries and the bulk of the people of Constantinople, ascended the throne, 1512. B. retired to spend the rest of his days at his birthplace, Demiloka, but died on the journey at Aya, near Hassa.

Baybay, a tn. on the W. coast of Leyte, Philippine Islands, 45 m. direct S.W. from Tacloban, the cap. of the prov.; pop. (1903) 22,990.

Bayberry, also called **Candleberry**, or **Wax Myrtle**, an evergreen shrub found in the United States. the W. Indies, and Cape Colony. Its leaves are fragrant when bruised; in the W. Indies they are used for makjng bay rum. The berries are covered with greenish-white wax, which is collected by boiling and skimming, refined, and used for making candles and scented soap. The candles while burning are very fragrant.

Bay City, cap. of B. co., Michigan, U.S.A., near the mouth of the Saginaw. It has considerable trade in lumber and fish (sturgeon, pickerel, bass, and whitefish), but its salt trade, once productive, is now declining. Its industries include shipbuilding, machinery, cement, and alkali works. There are also coal mines and beet sugar factories in the vicinity. Pop. over 40,000.

Bayer, Gottlieb Siegfried (1694-1738), son of the astronomer, born at Königsberg; studied the oriental and Chinese languages. Some of his works were pub. in the *Memoirs of the Academy of Petersburg* and the *Acta Eruditorum*. His *Opuscula* were pub with a life by Klotz, Halle, 1770.

Bayer, Johann (1572-1625), astronomer, *b.* at Rhain in Bavaria, followed the profession of a lawyer at Augsburg. In 1603 he pub. a chart of the stars, *Uranometria*, in which for the first time he included twelve new constellations of the S. hemisphere, and also employed letters of the Greek alphabet in star-nomenclature. His S. constellations are said to have been derived from the observations of a Dutch navigator.

Bayern, *see* BAVARIA.

Bayeux, episcopal city of Calvados dept., Normandy, France, on R. Aure, 17 m. N.W. of Caen. In the ancient cathedral was preserved the famous B. tapestry (*q.v.*), now in the museum. It has manufs. of lace, china, and textiles, and a good trade in agricultural produce. Pop. 7310.

Bayeux Tapestry is a roll of linen 20 in. wide and 231 ft. long, preserved at Bayeux in Normandy, upon which is worked in coloured woollen thread the events connected with the invasion and conquest of England. It is not, strictly speaking, tapestry, as it is worked in sampler fashion. The work is divided into seventy-two compartments, with descriptions in Latin, and the crude and unnatural colours still retain their freshness. Various conjectures as to its origin have been made, tradition assigning it to Matilda, wife of William the Conqueror; it was more probably worked for his half-brother, Odo, Bishop of Bayeux, in 1048. It was first mentioned in the 14th century, when an inventory was made of the goods in Bayeux Cathedral, which it adorned. In 1724 a drawing of a portion of it was presented to M. Lancelot, a member of the Académie des Inscriptions, and this led to public knowledge of the work. In 1803 it was sent to Paris by order of Napoleon for a short inspection, but was shortly after returned, and in 1816 Charles Stothard was sent by the English Society of Antiquaries to make an accurate copy of it. His drawings of it were published in the sixth vol. of

Vetusta Monumenta in 1819. *See* Jules Comte's *Tapisserie de Bayeux*, 1878; Rev. J. C. Bruce's *Bayeux Tapestry Elucidated*, 1885; and F. R. Fowkes's *Bayeux Tapestry*, 1898.

Bay Islands, a small group off Honduras, discovered by Columbus in 1502. The largest is., Roatan, is 30 m. long by 9 m. broad. These is. were occupied by British settlers in the 17th century, but not formally annexed until 1852. In 1859 they were ceded to Honduras. Their principal produce consists of cocoa-nuts, bananas, and other fruit, which are exported to the U.S. Pop. 3000.

Bayle, Pierre (1647-1706), Fr. critic and controversial writer, *b.* at Carlat in France. Educated at the Catholic University of Toulouse, where he made a profession of Catholic faith, which he subsequently revoked; 1670 went to Geneva; 1674 came to Paris; held the chair of philosophy at Sedan for five years; losing this by reason of a decree of Louis XIV., he went to Rotterdam. 1695 pub. the first vol. of his *Dictionnaire Historique et Critique*. It was extremely popular, being unlike anything pub. before it; it was of great use before the advent of encyclopædias, and is scarcely superseded now for certain information. There have been many eds. of it, one of the most famous being by Abbe Chaufpié, who added a supplement. A Life of Bayle was prefixed by P. des Maizeaux to his edition of the dictionary.

Baylén, or Bailén, tn. of prov. Jaën, Spain, 7 m. S.W. of Linares. The neighbourhood is fertile, and there are galena and blende mines. General Castaños defeated the French under Dupont here in July 1808. Pop. 7500.

Bayliss, Sir Wyke (1835–1906), an Eng. artist. He was born at Madeley, and studied at the Royal Academy. He became president of the Royal Society of British Artists in 1888 and was knighted in 1897. His talent was directed chiefly in the delineation of interiors of cathedrals and churches; the most notable of his paintings are: La Sainte Chapelle, 1865; St. Mark's, Venice, 1880; St. Peter's, Rome, 1888; and The Golden Duomo, 1892. He is also the author of sev. books, including *The Higher Life in Art*, 1879; *The Enchanted Island*, 1888; *Rex Regum: a Painter's Study of the Likeness of Christ*, 1898; and *Five Great Painters of the Victorian Era*, 1902.

Baylor University is a Baptist educational institute situated at Waco, Texas, formerly at Independence in the same state. It was chartered in 1845 and removed to Waco in 1882. It has a large library and about 800 students.

Bayly, Ada Ellen, writer of popular novels, wrote under the pseudonym of Edna Lyall (*q.v.*).

Bayly, Thomas Haynes (1797–1839), English ballad writer and dramatist, was *b.* at Bath, and educated at Winchester and Oxford. His plays and novels are now forgotten, but some of his songs are still familiar. Their mild sentimentality, expressed in facile if not very poetic verse, then exactly suited popular taste, and *She wore a Wreath of Roses, We met—'twas in a Crowd*, and *Gaily the Troubadour*, etc., were sung everywhere. His most successful play was *Perfection*. He also wrote two novels, *A Legend of Killarney* and *The Aylmers*.

Bayne, Alexander (*d.* 1737), first professor of law in Scotland; son of John B. of Logie in Fife. Became an advocate at the Scottish bar, 1714: in 1722, professor of Scots Law at Edinburgh; edited and wrote several works on Scots Law, many of which were acute and bold.

Bayne, Peter (1830–96), a Scottish journalist and author. He graduated at Marischal College, Aberdeen, and studied theology for the ministry at [illegible] osophy under [illegible] an of the Eng. [illegible] the *Weekly Review*. He was also associated with the *Christian World*, and contributed to numerous London periodicals. He pub. essays on De Quincey, Hugh Miller, etc., and wrote the *Testimony of Christ to Christianity*, 1862; and a *Life of Luther*, 1887.

Baynes, Thomas Spencer (1823-87). was the son of a Baptist minister at Wellington, Somerset. He was sent to Edinburgh University, where he was a pupil, and afterwards assistant, of Sir William Hamilton. In 1850 he became editor of the *Edinburgh Guardian*, and in 1858 was appointed assistant editor of the *Daily News*. Six years later he became professor of logic, metaphysics, and Eng. literature at St. Andrews University, and held this position for the rest of his life. From 1873 to 1881 he was sole editor of the ninth ed. of the *Ency. Brit.*, and even when his health obliged him to resign part of his responsibility to Robertson Smith, he still continued to write, his best-known article being that on Shakespeare, since reprinted, with other essays, in *Shakespeare Studies*. His other works include an *Essay on the New Analytic of Logical Forms*, 1850, and a translation of Arnauld's *Port Royal Logic*.

Bay of Islands, a deep and spacious

inlet on the N.E. coast of New Zealand, shut in by a number of is. It is naturally fitted to become an important harbour, but at present has only one small settlement, Russell.

Bayonet is the name of a short spear-like weapon as used in the British army, 12 in. in length. When not in use it is carried in a scabbard on the soldier's left side; when in use it is fixed to the muzzle of the rifle, and forms the thrusting weapon of the infantry. The original weapon is thought to have been invented at Bayonne in the 17th century; it was triangular in section, and had a tapering point.

Bayonne, fortified city of Basses-Pyrénées, Gascony, France, at the confluence of the rivers Adour and Nive, 3 m. from the sea, 4 m N.E. of Biarritz, and 18 m. N.E. of the Spanish frontier at Fuenterrabia. The rivers divide it into three parts, Great and Little B., and St. Esprit. The harbour admits vessels of 2500 tons, but is rendered difficult of access by the bar on the Adour. The depth at its entrance at high water is 16-19 ft. The city is well built, with good quays and promenades, a mediæval cathedral, and a fine citadel by Vauban. Chief industries, shipbuilding, leather dressing, distilling, and manufs. of pottery and chocolate. It was formerly famous for its hams. The city has been frequently besieged, but never taken. It was the ancient Rom. *Lapurdum*. Pop. 27,601.

Bayonne, a city of Hudson co., New Jersey, U.S.A., on New York and Newark Bays, 6 m. S.W. of New York. It lies just S. of Jersey City, from which it is separated by the Morris Canal, and opposite Staten Is., from which it is separated by the Kill van Kull. It is largely residential, but has manufs. of boilers, chemicals, paint, borax, etc., and large petroleum refineries. The Port Johnson Coal Docks are near. Pop. 45,000.

Bayou (Fr. *boyau*, channel), a term originally applied in some of the southern states of N. America to a branch of a river or lake, but now sometimes loosely applied to streams of various descriptions.

Bay Psalm-Book was the first book pub. in the American colonies. It appeared in 1640, under the guidance of Richard Mather, Thomas Welde, and John Eliot, and was a rendering into verse of the Psalms.

Bayreuth, *see* BAIREUTH.

Bay Rum, an aromatic liquid, obtained by mixing oils of bay with alcohol, water, and oils of pimenta and orange-peel. It is of value as a perfume and cosmetic.

Bay State, a name often applied to the state of Massachusetts, U.S.A., which was estab. in 1628-30 as the Massachusetts Bay Colony.

Bayswater, a dist. of London N. of Hyde Park. It is 4 m. W. of St. Paul's, and is situated on the Metropolitan District and Central London Railways.

Bayuda or Bahinda Steppe is a large desert of Nubia, Egyptian Soudan, in the bend of the Nile, N. of Khartum, which contains sev. rocky mts. and sparse vegetation.

Bay Window, the name given to a window projecting from the front of a building, and forming part of a rectangle or polygon. If semicircular it is called a *bow* window. B. Ws. were introduced into England about the end of the Wars of the Roses, and were very common in Tudor houses. A very fine example is that of the banqueting-hall at Hampton Court. A B. W. well above ground supported by a bracket or corbel, is properly termed an oriel.

Baza, the Rom. Basti, is a tn., prov. of Granada, Spain. It is the seat of a bishop, and was prosperous under the Moors. It is situated in a fertile valley which produces hemp, flax, fruit, and grain, and is famed for its red wines. *Pop. 13,000.*

Bazaar (Persian *bazar*, market), the Oriental name for a market-place, where various objects are exposed for sale. The most noteworthy of these are to be found at Cairo, Constantinople, Ispahan, and Tabriz. In the W. the term has been extended to shops which sell fancy goods, and to sales of fancy articles which are contributed gratuitously for charitable or religious purposes.

Bazaine, François Achille (1811-88), marshal of France, entered the army as a private soldier in 1831, served in Algeria, and in four years became lieutenant, with the Cross of the Legion of Honour. In 1839 he was a captain, and a few years later brigadier-general. He distinguished himself in the Crimean War, and was made governor of Sebastopol on its capture. Gaining fresh laurels in Italy (1859) he was appointed to command, first a division, and afterwards the whole army, in the Mexican expedition. Here, however, he was accused of mixing up political and personal aims with his generalship, and on returning to France in 1867 was coolly received by Napoleon III. In 1870, at the outbreak of the Franco-German War he was appointed to command the third corps, and afterwards the whole army, of the Rhine. He has been greatly blamed for the defeat at Spicheren, when he allowed General Frossard to be beaten unsupported; but this was little to what followed. B. retreated with his

Epic, 1834; *Venetia*, 1837; and *Henrietta Temple*, 1837. During this period of his life he lived as a fashionable young man about town, and was received almost everywhere. He was credited with a number of extravagances in dress, and to such an extent was this remarked on later that he wrote to the press denying that he had committed such extravagances. He pub. a number of political pamphlets, and made no secret of the fact that he intended to go far as a politician. In 1837, on the death of William IV., a fresh election took place, and he was invited to contest Maidstone, for which constituency he was returned in that year, with Mr. Wyndham Lewis as his colleague. In Dec. of the same year he essayed his first speech in parliament, and it was on this occasion there occurred that famous scene when, howled down by the House, he threw defiance in its face and warned the mockers that the day would come when they *would* hear him. To those who listened, and were judges, even this failure showed promise of the excellence to come later. In 1839 he published his novel, *Tragedy of Count Marcos*, and in the same month he married the widow of his late colleague, Mr. Wyndham Lewis. In her he found the sympathy and courage which were to be so necessary an asset in his life. With her fortune he was able to buy an estate at Hughenden and to establish himself as a country gentleman. From the time of his failure in parliament he awaited his opportunity, known in the House only for the bitterness with which he attacked the Whigs. By 1842 he was the leader of the Young England party. But in 1846, in Jan. of that year, by his famous onslaught against Sir Robert Peel in the Corn Law debates, he became the virtual leader of the Conservative party, though nominally it remained under the leadership of Lord George Bentinck. In 1844 had appeared *Coningsby*, in 1845 *Sybil*, and in 1847 *Tancred*, three political novels which were intended to explain the origin and the positions and duties of the great political parties. In 1852, as leader of the House, and *Chancellor of the Exchequer*, he introduced a free trade budget which was defeated because of the extension of the house-tax and income-tax. On this memorable occasion he gave utterance to the dictum 'that England does not love coalitions.' In 1858 he again returned to office, but the 'fancy franchises' drove him and his party to a sojourn of seven years in the political wilderness, during which period Disraeli added considerably to his reputation as a debater and a politician. In 1867 he came back again into office in the third Derby administration, and then came one of the most striking political incidents, the 'leap in the dark' which 'dished the Whigs.' In that year he introduced a Reform Bill more democratic and sweeping than anything which the Liberals had introduced. In the next year he succeeded Lord Derby as the head of the administration, but at the end of the year, not having a majority, he resigned. In 1870 he pub. *Lothair*. In 1874 he began his second administration, an administration noted chiefly for its foreign and imperial policy; in 1875 he acquired the half rights in the Suez Canal; in the following year he proclaimed Queen Victoria Empress of India, and in the same year retired to the House of Lords as Earl of B. The Bulgarian atrocities did not excite him to pity, but rather made him declare in face of the threatened aggression of Russia that our policy was to support to the best of our ability the sinking fortunes of Turkey. When the aggression became still more threatening he sent a fleet to the Dardanelles, voted money for war purposes, and stationed an Indian contingent at Malta. In 1878 followed the Congress of Berlin which raised B. to the greatest height of his power, and gave Russia all she wanted and England 'peace with honour.' The wars in Afghanistan and Zululand, together with the commercial depression, gave the opposition their opportunity, and the 'imperial' policy was condemned at the general election of 1880. A large Liberal majority was returned and the gov. resigned. In the same year appeared the novel *Endymion*, and in April of the following year, on the 19th of that month, the great statesman passed away. It was proposed that he should be buried in Westminster Abbey, but the terms of his will had forbidden that, and he was buried at Hughenden. 'A combination of genius, patience, intrepidity, and strength of will, such as occurs only at intervals of centuries, could alone have enabled him to succeed, and that combination is greatness.' The first 2 vols. of the authoritative life based on his papers were pub. in 1910 and 1912, ed. by W. J. Moneypenny. See also *Memoirs* by T. E. Kebbel, J. A. Froude, and H. Gorst; Sir W. Fraser, *Disraeli and his Day*.

Beadle (also Bedel, A.-S. *bydell*, a summoning officer), an official whose history has had many variations. Orignally, in Saxon times, he called householders to 'the moot.' After the Conquest he was an officer both of the manor and the church, but

gradually developed into a par. constable. The university bedells, once important functionaries, now figure only in official processions. In the Scottish Church the B. attends on the minister when divine service is being held.

Beadon, Sir Cecil (1816–81), lieutenant-governor of Bengal. He was educated at Eton and Shrewsbury, and entered the Bengal civil service at the age of eighteen. He held important secretarial posts subsequently with great success, ultimately becoming, at the instance of Lord Channing, lieutenant-governor of Bengal. He died in 1881, after a residence of thirteen years in England.

Beads, ornaments which have been used for decoration and barter from remote times, beautiful examples being found in early Egyptian tombs. At the present time they are still the medium of exchange with barbaric nations. They are made of gold, gems, coral, glass, etc. The manuf. of glass B. in Britain is carried on chiefly at Birmingham; on the Continent Venice is noted for the enormous variety and quantity of B. made there. In the process of manufacturing glass B., the glass is blown into a bulb, and drawn out into long tubes. The B. are then pinched or cut off, and heated in cylinders which rotate. To prevent the sticking together of the B. sand and ashes are put into the cylinders.

Bead-tree, or *Melia Azedarach*, is a tropical plant cultivated for its flowers, which somewhat resemble the lilac. The berries are sweetish, and are sometimes said to be poisonous.

Beagle, the smallest variety of Eng. hound, much used in hare-hunting, there being over forty packs in Great Britain and Ireland. It has a very keen scent, great powers of endurance, and intelligence. It is 10-16 in. in height, has long, thin, pendulous ears, a deep chest, and strong widely set shoulders. The coat is thick and flat and of the usual variety of colours of the hound.

'Beagle,' Voyage of the. In 1831 the British gov. sent out a surveying expedition in the B., a brig of only 235 tons, commanded by Captain Fitzroy. In this voyage, which lasted five years, Charles Darwin, as honorary naturalist on the staff, won his first laurels.

Beak, *see* BILL.

Beaked, in heraldry, indicates that a bird has a bill which is of a different colour to the rest of its body.

Beaker (Gk. *βίκος*, wine-jar), a cylindrical or conical vessel made of annealed glass used in chemical operations for making solutions, in analyses, and for various other purposes.

Beal, Samuel (1825–89), Chinese scholar, born at Devonport; educated there and at Cambridge; ordained 1852, and became a naval chaplain on board H.M.S. *Sybille*, which went to the China station. B. spent his spare time in acquiring the language; acted as naval interpreter during the war of 1856-8, and continued his studies after settling in England. His valuable works include *The Travels of Fah-hian and Sung-yun*, 1869; *A Catena of Buddhist Scriptures*, 1871; *The Legend of Sakya Buddha*, 1875; *Texts from the Buddhist Canon*, 1878; etc.

Beal, Robert (1541–1601), diplomatist and antiquary. His early life is shrouded in some obscurity. At an early age he gave considerable attention to the existing theological doctrines, and held views of an unorthodox nature, for he was compelled to leave England during Mary's reign, until Elizabeth's accession. He became Walsingham's secretary in 1570, and frequently carried dispatches between London and Paris. He entered parliament in 1572, and it devolved upon him to read to Mary, Queen of Scots, her death warrant. His works are voluminous, and include treatises upon complicated marriages, *Discourse after the Massacre of St. Bartholomew's* of which he was an eye-witness; *A Book respecting Ceremonies, the Habits, the Book of Common Prayer, and the Power of Ecclesiastical Courts;* and *The Order and Manner of the Execution of Mary, Queen of Scots.*

Beale, Dorothea (1831-96), a pioneer in the improvement of feminine education, was the daughter of a London physician. Early in life she showed a strong bent towards educational work; studying in 1848 at the Queen's College for Ladies she rose to be one of the prin. teachers. In 1857 she was appointed head of the school for clergymen's daughters, in Westmoreland, and in 1858 took charge of the Ladies' College at Cheltenham, which she raised in a few years to very high rank. Deeply religious, she was also broad-minded, and had great influence over her pupils.

Beale, Lionel Smith (1828–1906), a distinguished English physician and physiologist, was born in London, and studied at King's College, where he afterwards held various professorships in the medical schools (1853-1896). He was a frequent contributor to the *Lancet*, and wrote many valuable medical works, some of which go far beyond the merely technical range, such as *The Mystery of Life*, 1871; *Life and Vital Action in Health and Disease*, 1875; and *Vitality and Natural Religion*, 1900.

Beside being F.R.S. he had many foreign scientific honours.

Beale, Mary (1632–97), an English portrait painter of the 17th century, daughter of a clergyman, Craddock by name. She was taught painting by Sir Peter Lely; she copied the It. masters, and was employed largely by the clergy. Her husband, Charles B., was a painter and colour maker. Her pictures, says Walpole, have much nature, but are heavy in colour.

Beam (from O.E. *béam*, a tree; cf. *hornbeam* and *whitebeam*), a piece of timber, as a house-beam, a weaver's beam, etc. The cross-timbers of a ship are her beams, so that when she heels over considerably she is 'on her beam-ends;' hence a common phrase signifying distress or difficulty.

Beaming is a dept. of weaving in which special workmen, called beamers, wind the warp threads on the weaver's beam firmly and evenly, ready to be woven. *See* WEAVING.

Beaminster, an anct. mrkt. tn. and parish of Dorset, 6 m. from Bridport, situated on the Brit. It is mentioned in the Domesday Book.

Beamish, North Ludlow (1797–1872), military writer. He was a native of Cork, and obtained a commission in the Irish Guards in 1816. He translated various military works from the German. He was an associate of many learned societies. Among his works of antiquarian value is a summary of Rafn's researches into the early Scandinavian discovery of America.

Beam-tree, or *Pyrus aria*, is a species of Rosaceæ which grows to a height of 20 to 40 ft. in Europe and Asia. The leaves are ovate, with serrated edges, and are white and downy underneath; the flowers grow in terminal corymbs, and the small red fruit resembles a haw. It is acid and astringent, and is sometimes called sorb or service-berry. The wood is used in turning, and beer is made by fermentation of the fruit.

Bean is the name given to the seeds of various plants, chiefly to those of the order Leguminosæ. The common or broad bean is known as *Vicia faba*, or *Faba vulgaris*, and has many varieties. The French or kidney bean is *Phaseolus vulgaris*, and the scarlet-runner *P. multiflorus*; both of these plants are grown in England, and the pods are eaten as vegetables. The latter is also used as an ornamental climber. *P. lunatus*, the Lima or duffin bean, is a native of S. America, with broad flat pods and short flat seeds. *P. Mungo*, the Mungo bean or green gram, and *P. radiatus*, the black gram, are beans which are given to horses. *Dolichos biflorus* is also called the horse-gram in India, and is excellent food for cattle, while the pods of *D. Lablab*, the lablab bean, are cooked for human consumption after the manner of kidney beans. Both *Glycine Soja* and *G. hispida* yield Soja beans; they are eaten in Japan, used as green fodder, and oil is extracted from the seeds. *Ceratonia siliqua* is the Mediterranean species known as the locust or carob bean; *Vigna sirensis* is the cherry-bean or cow-pea of tropical Asia; *Mucuna utilis*, the tropical velvet-bean; *Canavalia ensiformis*, the sword or sabre bean of India; *Physostigma venenosum*, the ordeal bean of Calabar.

Of a few plants which are not leguminous, but whose seeds are known as beans, may be mentioned *Nelumbium speciosum*, the Egyptian or sacred bean eaten in Cashmere; *Strychnos Ignatii*, St. Ignatius bean, with poisonous properties; *Menyanthes trifoliata*, the bog- or buck-bean of Europe, Asia, and N. America. The bean-caper is an eastern plant, *Zygophyllum fabago*, whose flower-buds are eaten as capers.

The value of beans as food is very great on account of the nitrogenous or proteid matter they contain. As forage for horses, cows, sheep, and pigs they have fattening and heat-giving properties. The enemies to which they are subject are two, fungi and insects. When attacked by fungus the beans can still be used as rich manure, but if by the bean-aphis, or *black dolphin*, they can often be saved by having their tops cut off. They grow best in warm, light, well-manured soil, and enrich the ground themselves for future use.

Bean-caper, a substitute for capers. *See* BEAN.

Bean-feast, a name derived from an old custom prevalent in Western Europe in connection with 'Twelfth Night' festivities. A bean was hidden in a large cake, and the person who got the slice containing it was 'king' of the revels. Though the festival was a religious one (the feast of the Epiphany), it was, like many other ceremonials, an adaptation from paganism. During the Roman Saturnalia, said to have been estab. by Tullus Hostilius (*c.* 650 B.C.), but probably much older, the children drew lots with beans to decide who should be king. This was a winter festival, and with a slight alteration of date was Christianised into the 'Feast of the Three Kings.' In old accounts of Twelfth Night revels in our own country, the bean-king or queen plays a prominent part. The French also have a phrase implying good luck, 'Il a trouvé la fève au gateau.' In later times the 'bean-feast' has lost its old associations, and now signifies

the annual feast or 'outing' of a firm's employees.

Bean-Goose, or *Anser segetum*, a small species of European wild goose with a comparatively short, black and red beak, which obtains its name from the resemblance of the upper nail of its bill to a horse-bean, or else from the fact that it eats the beans sown in the spring. It is of a grey colour, and breeds largely in the Hebrides.

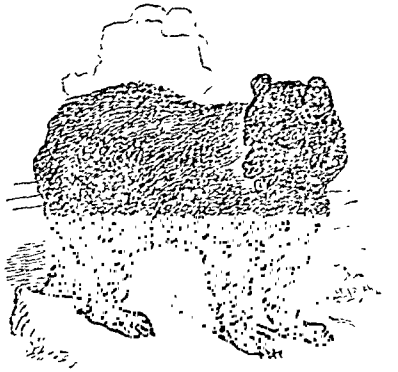
Bean-King's Festival was held on Twelfth Day, the Feast of the Epiphany, Jan. 6. Originally observed in honour of the Three Kings, or Magi. A large cake in which a bean was hidden was produced and divided among the assembled guests. The finder of the bean was proclaimed Bean-King for a year, on condition that he should provide the entertainment on the next Twelfth Day. The custom used to prevail in England, but received more attention in France.

Bean-tree, a name given to species of two genera of Leguminosæ which occur in the tropics. *Castanospermum Australe*, also known as the Australian chestnut, has edible seeds which resemble chestnuts in flavour when roasted. *Erythrina corallodendron* is the other species, which is a native of Jamaica.

Bear, Bere, or Beer, a common name for the four-rowed variety of barley (*q.v.*).

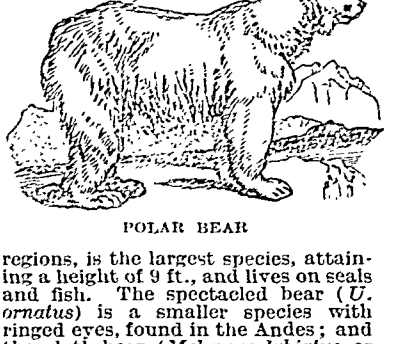
Bear is a small genus of widely-distributed carnivorous (often omnivorous) mammals of the family Ursidæ and div. Arctoidea. They are large, ungainly animals, with short tails, shaggy fur, plantigrade feet, curved claws which are non-retractile, broad, elongated heads ending in a snout. Their usual method of progression is on all fours, but they are capable of walking upright with a clumsy, shuffling gait, and most of them are splendid climbers. They do not usually attack man unless provoked, but when roused they are very ferocious; in their strong arms they can hug a human being until suffocated. Though they sometimes eat flesh, they prefer fruit and honey, and many of them are fond of termites, or white ants. Most of them eat largely during the summer months, and then hibernate, coming out again in the spring in a weak but fierce state. During the winter months the cubs are born, and unless carefully guarded by their watchful mothers they fall a prey to the greed of their fathers. The young are blind at birth.

The various species have many dissimilar points. The brown bear (*Ursus arctos*) is spread through all the mt. dists. of Europe, from the Arctic circle to the Alps and Pyrenees, and is also found in Asia. It is about 6 ft. long and 3 ft. high at the shoulders, yet it can easily climb rocks and trees; it can attain the age of fifty years. The fur of this animal is of a yellowish colour in youth. The American black bear (*Ursus Americanus*) is a smaller



AMERICAN BLACK BEAR

species than the brown bear, of which it is thought to be a variety. It is an object of great veneration among the Indians. The grizzly bear (*U. horribilis*) is a native of N. America; it is very large, strong, and fierce, has wonderful powers of endurance, and is a great hunter. The polar bear (*U. maritimus*), found in the Arctic



POLAR BEAR

regions, is the largest species, attaining a height of 9 ft., and lives on seals and fish. The spectacled bear (*U. ornatus*) is a smaller species with ringed eyes, found in the Andes; and the sloth bear (*Melursus labiatus* or *ursinus*) dwells in mountainous parts of India and lives chiefly on termites. It is a savage creature, yet is often led about by Indian mountebanks and jugglers.

Bear, Great and Little, *see* URSA MAJOR and URSA MINOR.

Bear-baiting, a cruel sport which

was popular in Europe for many centuries. It was greatly in favour with the ancient Roms., and was popular in England from Norman times down to the 18th century. Private bear-gardens, or baiting-places, were kept by nobles and gentry, beside those provided by caterers for popular amusement, such as the famous 'Bankside,' where the charges were 'a penny for admission, a penny at the entry of the scaffold, and a penny for quiet standing.' Mary Tudor and Elizabeth were both fond of witnessing this sport. Every one remembers the enthusiastic description of it by Sussex, in *Kenilworth*, and the queen's amused appreciation of his eloquence! The Privy Council in 1591 ordered all theatres to be closed every Thursday, because baitings generally took place on that day, and actors could not be allowed to prejudice such excellent entertainments by their competition. Another favourite day was Sunday, which was a further reason, beside that suggested by Macaulay, for the Puritan interdiction of such sports.

Bearberry, or *Arctostaphylos*, is a genus of Ericaceæ which grow in Alpine regions and in N. America. *A. Alpina*, the black B., is not so common as the evergreen *A. Uva-ursi*, red B., but both grow in mountainous parts of England and Scotland. The flowers show when the snow disappears, and the soft berries, containing one to five seeds, are eaten by grouse and other birds. The whole plant is used by tanners, and dyes a greyish-black colour.

Bear Lake, Great, is a large fresh-water lake in the N.W. of Canada. Its shape is irregular, and it has an area of over 11,000 sq. m. The water is extremely transparent and abounds with fish, especially the so-called herring salmon. It has an outlet in the Great Bear riv., which flows into the Mackenzie.

Bear River, a stream about 450 m. long, rising in the Rocky Mts., and flowing after a circuitous course through Utah and Idaho, into Great Salt Lake. On its banks are mineral springs containing magnesia, etc.

Beard. The fashion of the B. has varied considerably in various times and countries. Though Pliny says the Romans did not begin to shave until A.U.C. 454, yet in later times the first day of shaving was considered as the entrance to manhood and was kept with great festivities. Cæsar says that the ancient Britons left the hair long only on the upper lip. The Saxons wore Bs., but the Normans shaved the whole of the face. The sepulchral monuments of kings and nobles show that for many centuries the B. was in fashion, but since the reign of James I. the practice of shaving has become more and more general.

Beard, George Miller (1839–83), American physician, *b.* in Connecticut. After serving in the U.S. navy for some years he settled in New York and became famous as a specialist on the character and treatment of nervous diseases, on which he wrote sev. works, his last being the *Study of Trance*, 1882.

Beard, John (1716?–1791), English actor. He received a musical training and gained some reputation as a singer at Covent Garden. Loss of hearing caused his successful career to come to an end. It is noteworthy that some of Handel's finest tenor passages were composed particularly for B. He died in Feb. 1791 at Hampton, Middlesex.

Beard, Thomas (*d.* 1632), *English* divine. He was educated at Cambridge. Soon after the acceptance of the rectory of Hengrave, Suffolk, B. became headmaster of Huntingdon hospital and grammar school, where he was Oliver Cromwell's schoolmaster. His most famous book is called *The Theatre of God's Judgements*. In this book the first account of Marlowe's death appeared.

Beard Grass is the popular name given to a British species of *Polypogon*. This genus of Gramineæ is seldom found in Britain and is a native of warm and tropical countries.

Beard Moss (Fr. *Barbe de Viellard*) belongs to the genus *Usnea* of lichens. It creeps over stems and branches of trees, hanging down in thick trails, whence its name.

Beardsley, Aubrey (1872-98), black-and-white artist, *b.* at Brighton, *d.* of consumption at Mentone. Worked for various illustrated papers at the age of twenty; and next year illustrated *La Morte d'Arthur*, which at once assured his fame. He was editor of the *Yellow Book*, but was expelled from that position: he joined with Mr. Arthur Symons in 1895 to edit the *Savoy*, an avowed rival to the *Yellow Book*. He illustrated the *Rape of the Lock*, Oscar Wilde's *Salomé*, *Mademoiselle de Maupin*, and Ernest Dowson's *Pierrot of the Minute*. He was at work on initial letters for *Volpone* three weeks before he died. His line-drawings were extremely delicate and exact, and showed that fastidious elegance that appears even in the most grotesque of his drawings. He had a great opinion of his writing too, and once described himself as a 'man of letters.' He was not, like Blake, the victim of his hallucinations, for when once asked whether he saw visions, he replied,

'No, save on paper.' *See* Arthur Symon's *Aubrey Beardsley*, new ed., 1905: Ross's *Aubrey Beardsley*, 1908.

Bearer Company, first introduced into the British army as a distinct organisation in 1873, then connected with the field hospital. Both are now parts of the Field Ambulance Corps.

Bearing, the direction of a line drawn from one point to another, is a term usually employed for the points of the compass; *e.g.* if the point B is due N.W. of A, it is said to *bear* N.W. of A, and its *B.* is said to be N.W. To take Bs. is to ascertain the points of the compass on which points lie.

Bear-leader is a term used jestingly of a person who is in charge of a young man of wealth when making a tour of the world, or of one who acts as guide to a celebrity. It arose from the custom of leading about a tame bear, muzzled and on a chain, for entertainment.

Béarn, ancient prov. of France, now included in the dept. of Basses-Pyrénées. Its capital was Pau.

Bear's Breech is a name sometimes given to the genus of Acanthaceæ known as *Acanthus* (*q.v.*).

Bear's Foot, or *Helleborus fœtidus*, is a common species of Ranunculaceæ in Europe. It is related to the Christmas rose.

Bear's Grease, or Bear's Oil, is a name applied to various pomades which are said to promote the growth of hair. B. G. is believed to strengthen the hair, but these preparations are usually manufactured from beef-marrow, lard, spermaceti, or a vegetable oil, together with an agreeable scent.

Bear's Whortleberry, or *Arctostaphylos Uva-ursi*, is the name sometimes applied to the red bearberry (*q.v.*).

Beas, or Bias, a riv. of the Punjab. It rises in the Himalayas and flows into the Sutlej. The Beas and lower Sutlej formed the 'Hyphasis,' which marked the farthest progress of Alexander the Great.

Beast, Number of the, *see* Apocalyptic Number.

Beat, a word used in various senses, the commonest being: in music, (1) the divs. in a bar, (2) the movement of a conductor's baton, (3) the tremulous effect produced when two notes very nearly in unison are sounded together; in physiology, the throbbing of the pulse or heart; in nautical parlance, the zig-zag sailing of a ship working up against the wind. The round of a sentry or policeman is also called his beat. As a verb the word is used both literally and metaphorically.

Beatenberg, or Saint Beatenberg, a summer health resort situated on the wooded heights to the E. end of the Lake of Thun, Switzerland.

Beath or Baith, a parish of Scotland, situated in the co. of Fife. It is 5¼ m. N.N.W. of Aberdour. Most of its inhab., numbering 4315, are engaged in its coal and iron mines.

Beatification, the act by which the pope permits a 'Venerabilis servus Dei,' one whose name has been brought forward as worthy of B., *i.e.* to be entitled to be called 'Blessed' (*beatus*). The privileges contain various limitations, and B. is generally only preliminary to canonisation (*q.v.*).

Beating the Bounds, or Perambulation, is a custom common to several European nations under different forms. In England, on Holy Thursday, or Ascension Day, the clergyman of the parish, with some officers and boys, used to walk in a procession to each of the different parish boundaries, and when there the boys would beat the boundaries with pealed willow-wands in order to remember their location. Sometimes the boys themselves were the objects of castigation and received a small sum of money for their pains.

Beaton, Cardinal David, or Bethune (1494-1546), Archbishop of St. Andrews and Lord High Chancellor to Mary Queen of Scots, a younger son of John B., or Bethune, of Balfour in Fife. He went to France to study civil and canon law, and in 1519 was appointed resident for Scotland at the French court. In 1533 B., now prothonotary apostolic (a high office in the church), was sent as an ambassador to France to treat for a league with the French king and a marriage between James V. and Princess Magdalene. In 1537 he procured the papal bull for the erection of St. Mary's College at St. Andrews; in 1538 became a cardinal, and 1539 Primate of St. Andrews. At the death of James V., 1542, B. produced a will in which he was stated to be appointed regent for the infant daughter of the dead king; this was a forgery, and James, Earl of Arran, became regent. B. still had great influence, and with the help of the nobles forced the regent to abjure the doctrines of the Reformation. In 1546 he tried and condemned George Wishart to be burnt. He opposed the designs of Henry VIII. of England for the marriage of Mary to his son Edward, and that monarch characteristically expressed a desire that B. should be assassinated, and B., after witnessing the marriage of his illegitimate daughter to the Earl of Crawford, was put to death by a party of reformers. His Lat. works were insignificant, and are now forgotten.

Beaton, James, or Bethune (*d.* 1539),

Scottish prelate, uncle of Cardinal David B., was Lord Treasurer of Scotland, archbishop of Glasgow, *1509*; chancellor, *1513*; and archbishop of St. Andrews and primate, 1522. As one of the regents during James V.'s *minority*, he was a chief mover in the Fr. alliance. Patrick Hamilton and other reformers were burned during his primacy. He died 1539. Another James B. (1517-1603), was a nephew of the cardinal. He was in the confidence of Mary of Lorraine when regent, and was the last Rom. Catholic archbishop of Glasgow, 1552 to 1560, when he fled to France, taking with him the archives of the see, which have never been recovered.

Beatrice, a city and co. seat of S.E. Nebraska, U.S.A. It is situated in the valley of the Big Blue R. and has a trade in dairy produce. Pop. 7875.

***Beattie,* James** (*1735-1803*), born at Laurencekirk in Kincardine; 1749 entered Marischal College, Aberdeen, where, in 1760, he became professor of moral philosophy and logic. In 1770 he pub. his *Essay on Truth* to confute Hume. It made a tremendous stir at the time. If he is now remembered at all it is by the mention of it in the lives of his great contemporaries; Johnson, always zealous for Christianity, praising it at the cost of Goldsmith, who estimated the ephemeral effusion at its true worth. George III., who could not know better than any one else, received B. with great warmth, and the champion of religion's fortune was made. Sir Joshua Reynolds introduced B. into a metaphorical painting as the Defender of Truth, with Hume and Gibbon skulking low with diabolical faces. The caricature could not be strained overmuch, for B.'s face had that stupid placidity which might be called angelic, and Gibbon always looked diabolical enough. The whole affair is now deservedly forgotten. In 1771 B. published *The Minstrel*, a poem for which alone he is remembered, and in 1773 received a pension. He died of palsy. Life by Sir Wm. Forbes. *See* Boswell's *Johnson* and Forster's *Goldsmith*, passim.

Beattie, William (1793–1875), Eng. doctor, poet, and classical scholar. He was born at Dalton, Annandale, and was educated at Clarencefield Academy, Dumfriesshire. He entered Edinburgh University as a medical student in 1812. For fourteen years he attended the Duke and Duchess of Clarence, receiving in return a service of silver plate. He practised in Hampstead for eighteen years, and afterwards travelled in Switzerland and the land of the Waldenses. He pub. illustrated works on the Danube, Switzerland, and contributed various articles to the Archæological Society, of which he was the foreign secretary.

Beattock, a vil. situated 2 m. S.W. of Moffat, in N. Dumfriesshire. It forms the junction on the Caledonian Railway for Moffat.

Beaucaire, a town in the dept. of Gard, S.E. France. It is situated on the Rhone, at the head of the Canal de B. The manufs. are silk, woollens, and leather. There are stone quarries in the neighbourhood. Pop. 7000.

Beauce, co. in the prov. of Quebec, Canada. It lies to the S.E. of the prov., on the N. frontier of the U.S. The Notre Dame Mts. are in the dist. and also Lake St. Francis.

Beauce, La, is a dist. in Central France, with an area of 2800 sq. m. It includes part of Eure-et-Loir and Loir-et-Cher. Wheat is largely cultivated.

Beauchamp, the name of an anct. and noble family of England. The founder, Walter de Beauchamp, obtained large estates in Worcestershire by his marriage with the daughter of one of the Conqueror's barons; from him descended William of Elmley (whence this family is styled the Beauchamps of Elmley), whose marriage with the heiress to the earldom of Warwick in 1268 brought Warwick Castle and the earldom to his son. Of the B. Earls of Warwick commemorated in the famous B. Chapel in St. Mary's Church, Warwick, the prin. was Guy, the 'black cur of Arden,' the enemy and executor of Piers Gaveston, and one of the Lords Ordainers in the opposition to Edward II. He *d.* in 1315. His sons, Thomas and John, were two of the first garter knights, and Thomas was one of the Lords Appellant, and imprisoned in the B. Tower of the Tower of London. The last B. Earl of Warwick died in 1445, and his sister, Anne, brought the earldom to the Nevilles on her marriage with Richard, the kingmaker. The present Earls B. are descended from William Lygon (1747-1816), who claimed descent through the female line from a cadet branch of the anct. family, the Bs. of Powycke. The viscounty of B. of Hache, granted to Edward Seymour, Lord Protector Somerset, belonged to a distinct family in Somersetshire. The title remains with the Marquis of Hertford, and the name in the family of the B. Seymours.

Beauchamp, Alphonse de (*1767-1832*), historian, *b.* at Monaco; joined the Sardinian army, and was imprisoned for refusing to serve in the war against the French republic. He came to Paris and obtained a government post at the ministry of police at the head of the press bureau. In 1806

he published his best-known historical work, *Histoire de la Vendée et des Chouans*, which led to the loss of his post and his retirement to Rheims. He returned to a post in 1811, which he resigned at the Restoration. Other works are: *Vie du général Moreau*, 1814; *Mémoires secrets et inédits pour servir à l'histoire Contemporaine*, 1825. He only revised Fouché's *Mémoires*, often attributed to him. *See* L. Madelin, *La Révolution Française*, 1900.

Beauchamp, William Martin, American ethnologist and clergyman, born in Coldenham, Orange co., N.Y., in 1830. For some time he held a cure in Baldwinsville, N.Y., and in 1886 was made examining chaplain for Central New York Diocese. He has made valuable archæological researches, especially among the Iroquois Indians. Among his works may be named *The Iroquois Trail*, 1892; *Aboriginal Chipped Stone Implements of New York*, 1897; and *History of the New York Iroquois*, 1905.

Beauclerk, Topham (1739-1830), the friend of Samuel Johnson, and member of the famous Club. He was a grandson of the first Duke of St. Albans. His wit, his infallible taste in literature, and knowledge as a man of the world, endeared him to Johnson, and he figures largely in Boswell's *Life*.

Beaufort, cap. tn. of Carteret co., N. Carolina, U.S.A. It is situated at the mouth of Newport R., S.W. of Cape Lookout, has a good harbour, and is a popular summer resort. Pop. 2181.

Beaufort, a town in the Maine-et-Loire dept., France, with a trade in corn, fruit, and linen.

Beaufort, cap. tn. of B. co., S. Carolina, U.S.A., situated on Port Royal Is., on the B. Riv., 16 m. from the sea. It has an important harbour. Its good climate has made it a popular winter resort. The 'rock-river' phosphate beds near B. are important. The tn. was first permanently settled, 1710, in honour of Henry Somerset, Duke of Beaufort. Pop. 4110, mostly negro.

Beaufort, the name of a noble Eng. family, members of which were Earls and Dukes of Somerset and Earls and Marquesses of Dorset; also the title of a dukedom, borne by members of the family of Somerset, descended from the Bs. The name of B. was borne by the children of John of Gaunt by Catherine Swynford, who were legitimated after their parents' marriage in 1396. Of these, John (*d.* 1410), Earl of Somerset, a Marquess of Dorset, was a supporter of Richard II. against the Lords Appellant; Thomas (*d.* 1426), Duke of Exeter, was one of Henry V.'s generals; Henry (*d.* 1447), was Bishop of Winchester and Cardinal (*see* BEAUFORT, HENRY, CARDINAL). Margaret, daughter of John, third Earl of Somerset (1403-44), married Edmund Tudor, Earl of Richmond, and was the mother of Henry VII. Three successive Bs., Earls and Dukes of Somerset, were killed or beheaded during the Wars of the Roses, supporting the house of Lancaster. Charles, the illegitimate son of one of these; Henry, third Duke of Somerset, beheaded after Hexham, 1464, was a favourite of Henry VIII., and made Earl of Worcester; his descendant, Henry, fifth Earl, was a loyal supporter of Charles I., and was made a marquess in 1642; in 1682 the third marquess was made Duke of B., the title now held by the ninth duke.

Beaufort, Henry (*c.* 1377-1447), cardinal and bishop, was the son of John of Gaunt and Catherine Swynford, born out of wedlock but legitimated in 1397 (*see* BEAUFORT, family). He entered the church and was made bishop of Lincoln in 1398, and on Henry IV. attaining the throne he became chancellor, 1403, and bishop of Winchester, 1404. He was also chancellor in 1413, and in 1424. During the reign of Henry V. and the minority of Henry VI. he was a prominent political figure, being the leader of the party opposed to Humphrey, Duke of Gloucester, especially in the matter of making peace with France. In 1426 he was made a cardinal by Martin V., for whom he had voted in 1417 at the Council of Constance, and was sent as papal legate to conduct a crusade against the Hussites in Hungary and Bohemia. He crowned Henry VI. as king of France in 1431. Charges were made against him by Gloucester, and attempts to deprive him of his see failed. He refounded and endowed the hospital of St. Cross near Winchester, which still exists, and on sev. occasions advanced large sums of money to the crown. He died at Wolvesey Palace, Winchester. *See* Radford, *Henry Beaufort*, 1908; Creighton, *History of the Papacy*, 1897; Stubbs, *Constitutional History*, vol. iii., 1895.

Beaufort, Louis de (*d.* 1795), Fr. historian. Little is known of his life, and he is chiefly remembered as one of the first writers who questioned the trustworthiness of the classical historians in the early history of Rome. His works include: *Dissertation sur l'Incertitude des cinq premices siècles de l'Histoire Romaine*, 1738, 2nd ed. 1750; *Histoire de César Germanicus*, 1761; and *La République Romaine*, 1766.

Beaufort, Margaret, Countess of Richmond and Derby (1443–1509), was the daughter of John, Duke of Somerset (*see* BEAUFORT, family), and married, in 1455, Edmund Tudor, Earl of Richmond, by whom she was mother of Henry, Earl of Richmond, afterwards Henry VII., whose title to the throne came to him through his mother as descendant of John of Gaunt. After her husband's death she married Henry, son of the Duke of Buckingham, and Thomas Stanley, Earl of Derby. She founded the Lady Margaret professorships of divinity at Oxford [illegible] founded by [illegible] College at [illegible] *Memoirs of Richmond a[illegible]*

Beaufort Testimonial was the result of a subscription raised in 1860 to commemorate the good services of Sir Francis Beaufort (1774-1857), rear-admiral to the British navy. It took the form of an annual prize awarded to a young naval officer of the Royal Naval College who, as a candidate for the rank of lieutenant, passed most successfully his examination in navigation and kindred subjects.

Beaufort West, a tn., cap. of B. W. div., Cape prov., S. Africa, 339 m. N.E. of Cape Town on the line to Kimberley. It lies 2792 ft. high, on the S. slopes of the Nieuwveld Mts., and is the largest tn. in this part of the Great Karroo. Pop. (div.) 10,762, (tn.) 5500.

Beaugency, a tn. of France in the Loiret dept., situated on the r. b. of the Loire, which here is spanned by a bridge of twenty-six arches. It is about 16 m. S.W. from Orleans. *The manufs. are woollens and leather*, and a trade is carried on in grain, wheat, and wine. There are also flour mills and distilleries. Pop. 3600.

Beauharnais, Alexandre, Vicomte de (1760-94), Fr. general, born in Martinique, was descended from an anct. noble family in Orléannois. In 1779 he married Josephine Tascher de la Pagerie, afterwards the first wife of Napoleon, by whom he had Eugène de B. (*q.v.*), and Horteuse, wife of Louis Bonaparte, King of Holland, and mother of Napoleon III. Alexandre B. served in the American War of Independence, came to France and joined the revolutionary party. He was secretary to the assembly, and commanded the army of the Rhine, 1793; his failure to relieve the siege of Mayence, and the suspicion attached to his noble birth, brought on him the enmity of the Committee of Public Safety, and he was tried and guillotined.

Beauharnais, Eugène de (1780-1824), son of Viscount Alexandre B.; at his father's death his mother, Josephine, married Napoleon Bonaparte, who treated her children, Eugène and Hortense, as if they had been his own. Eugène accompanied Bonaparte to Italy and Egypt, and was made a prince of the empire, and appointed viceroy of the (so-called) kingdom of Italy; he married, in 1806, the daughter of the King of Bavaria. After suffering defeats from the Russians and Austrians, he retired with his family to Bavaria.

Beauharnois, a co. of S.W. Quebec. The St. Lawrence forms its N. boundary. Its area is 250 sq. m., and it is drained by the R. Chateauguay. Its chief tn. is of the same name, and its pop. 14,757.

Beaujeu, a Fr. tn. in the Rhone dept., about 27 m. from Lyons.

Beaujolais, a dist. forming part of Rhône and Loire, specially famous for its manufacture of burgundy.

Beaulieu, a Fr. winter resort in the Alpes-Maritimes, 4 m. from Nice. It possesses a good harbour. Pop. 1460.

Beaulieu, a parish of S. Hampshire, England. It is situated on the estuary of the river Beaulieu, about 5 m. from Southampton and 6 m. from Lymington. It has an abbey, now in ruins, founded by King John, which sheltered Margaret of Anjou after the battle of Barnet.

[illegible] tn., the 10 the remains of the Cistercian priory of St. John, 1230, and the site of Lovat Castle. Pop. 855.

Beaumarchais, Pierre Auguste Caron de (1732-99), born at Paris, son of a watchmaker; he was brought up as a watchmaker, and also showed great skill in music, playing the harp and guitar. His great proficiency attracted the notice of the daughter of Louis XV., and he was admitted to court. His fame as a writer rests on his plays, and principally on *Le Barbier de Seville* and *Le Mariage de Figaro*, on both of which operas have been written. The character of Figaro was a happy invention, and his characters are always drawn with great skill. See *Le Barbier de Seville* in Les Classiques Français.

Beaumaris, a Welsh parish, port, and mrkt. tn., also the cap. of Anglesey. It is situated on B. Bay, to the N. of Menai Strait. The harbour is *easily reached, safe, and roomy*. The tn. is frequented by summer visitors, who are attracted by the golf links and the excellent sea bathing. There are slate quarries in the neighbourhood. The castle was founded by Edward I. in 1295. Pop. 2500.

Beaumes-de-Venise, a tn. of Vaucluse, France. It has mineral resources, cultivates the vine and mulberry, and contains an old Roman church. Pop. 1500.

Beaumont, a banking city and co. seat of Jefferson co., Texas, on the Neches R., and sev. railways such as the Texas and New Orleans. It exports lumber, rice, shingles, and live stock, has a foundry, machine-shops, and car-works, and is noted for its oil deposits. Pop. 15,000.

Beaumont, a tn. of Belgium in the prov. of Hainault, about 15 m. from Charleroi. There are marble quarries and iron-works in the district.

Beaumont, a small French tn. in Puy-de-Dôme, situated at a distance of 2 m. from Clermont-Ferrand, the cap. of the dept. Pop. 1300.

Beaumont, Eon de, Charles Geneviève Louise Auguste André Timothée (1728-1810), was a famous Fr. diplomatist. *See* under EON DE BEAUMONT.

Beaumont, Francis (1584-1616), Eng. poet, third son of Francis B., a judge of the Court of Common Pleas, *b.* at the family seat of Grace Dieu, in Leicester. He entered, at the age of ten, Broadgate's Hall (now known as Pembroke College), Oxford; but his



FRANCIS BEAUMONT

father died in 1598, and he left without taking a degree. He became a student at the Temple, 1600; as his life was short and his writings numerous, it is reasonable to suppose that he paid little attention to law. He records in a poetical epistle his intimacy with Ben Jonson and other men of literary pursuits, who frequented the Mermaid Tavern; here probably he met John Fletcher, with whom his name is always connected. Their friendship was remarkably close, and they lived together until B., in 1613, married Ursula, daughter of Henry Isley, of Sundridge in Kent, by whom he had two daughters. He was buried in Westminster Abbey. The masterpieces of B. and Fletcher are *Philaster* and *The Maid's Tragedy*. Fletcher is generally regarded as having contributed the vivacity and B. the judgment, the latter's duty being often to correct the overflowings of Fletcher's wit; they had a 'wonderful consimility of phansy' (Aubrey).

The purest characters in their plays are not free from an admixture of coarseness, while chastity is overwrought and put to absurd and gratuitous trials, so that some of the freshest and loveliest passages are found side by side with fantastic affectations.

B.'s only certain single play is *The Masque*. B. and Fletcher produced *Four Plays in One*, 1608; *King and no King*, 1611; *Cupid's Revenge*, 1611 (?); *Knight of the Burning Pestle*, 1611; *Maid's Tragedy*, 1611; *Philaster*, 1611; *Coxcomb*, 1612-13; *Wits at Several Weapons*, 1614; *Scornful Lady*, 1616; possibly *Thierry and Theodoret*, 1616; and *Little French Lawyer*, 1620. B. may have co-operated with Massinger in *Laws of Candy*.

Eds. of B. and Fletcher: Bullen, 11 vols. 1904; Glover and Waller, 15 vols. 1909; Dyce, 11 vols. 1843-6. *Life of Beaumont*, by G. C. Macaulay, 1883. *See* E. Rhys, *Lyric Poems of Beaumont and Fletcher*, 1897. *See* FLETCHER, JOHN.

Beaumont, Sir George Howland, the seventh baronet of the ancient family of the B.'s of Stoughton Grange, Leicestershire, was *b.* in 1753, and educated at Eton. He was a distinguished amateur of the arts and friend of artists, possessed himself considerable skill as a landscape painter, and was one of the most munificent donors to the British national collection of pictures. He died in February, 1827, without issue.

Beaumont, Jean Baptiste Elie de (1798-1874), French geologist, born at Canon, studied with great distinction at the Lycée Henri IV., the Ecole Polytechnique, and the Ecole des Mines. He went with the professor of geology, Brochant de Villiers and Dufrénoy to England with a view to preparing a geological map of France after the publication of Greenough's map, 1820. The result was later seen in the map pub. by him and Dufrénoy, 1840, his greatest service to geology. In 1835 he succeeded Brochant de Villiers in the chair of geology, and was engineer in chief,

1833, and inspector general of mines, 1847. He was perpetual secretary of the Academy of Sciences, 1853, in succession to Arago. His theory of the origin of mt. ranges, *Notice sur les système des Montagnes*, 1853, is not now accepted, but it was of great value from the detailed researches he made in its preparation.

Beaumont, Sir John (1583–1627), English poet. He was born in Leicestershire, an elder brother of Francis B., and educated at Oxford, which he entered in 1596. He was knighted in 1603. His patron was the Duke of Buckingham. In religion he was a Puritan. Among his friends, not the least intimate was Michael Drayton. He was buried at Westminster Abbey. See *Works*, ed. A. B. Grosart, 1869.

Beaumont, Joseph (1616-99), Eng. poet. He was *b.* at Hadleigh, Suffolk, and was educated at the local grammar school, where he showed an exceptional facility for acquiring knowledge. He subsequently entered Cambridge. His poems include an epic *Psyche*, and a number of minor pieces. As an artist B. had a small reputation.

Beaumontague, the name given to a composition of iron filings, pitch, salammoniac, and other materials employed to fill up flaws in casting; also applied to putty-fillings in defective joinery.

Beaumont-de-Lomagne, a Fr. town in the dept. of Tarn-et-Garonne, about 22 m. from Montauban.

Beaumont-le-Roger, an anct. French tn. in the dept. of Eure. It is of great historic interest, and contains a parish church with magnificent windows. Pop. about 2000.

Beaumont-sur-Oise, a tn. of France in the dept. of Seine-et-Oise, on the Oise, about 18 m. from Paris. It has a trade in grain, cattle, and cheese. Pop. 4000.

Beaumont-sur-Sarthe, a tn. of France in the dept. of Sarthe, on the river of the same name, and about 15 m. S. of *Alençon*; *pop.* 2000.

Beaune, a town in the E. of France, in the dept. Côte d'Or. Its manufs. are white metal, oil, vinegar, and casks. It is the centre of the burgundy wine trade. Pop. 11,000.

Beaune, Florimond de (1601-52), Fr. geometer and friend of Descartes, was born at Blois. He commentated on Descartes' geometry, is noted for his problem on curves, and invented sev. astronomical instruments.

Beaune-la-Rollande, a French tn. in the dept. of Loiret. It is of great antiquity, was devastated by the English in the middle ages, and its church was rebuilt by Charles VII. Here the French, under D'Aurelles de Paladine, were conquered by the Germans, Nov. 28, 1870. Pop. about 2000.

Beaupréau, a Fr. town in the dept. Maine-et-Loire, situated on the Evre, about 28 m. from Nantes.

Beauregard, Pierre Gustave Toutant (1818 – 93), American confederate-general, born at New Orleans, graduated at W. Point, 1838, and gained promotion in the Mexican War by distinguished service at Vera Cruz, the battles round Mexico and Chapultepec, where he was wounded. The civil war broke out almost immediately after his appointment to the head of W. Point. At the first battle of Bull Run he was second to General Joseph Johnston. Appointed full general, Aug., 1861, he commanded the confederate army at Shiloh, 1862, after A. S. Johnston's death in the battle and withdrew to Corinth, which position he defended against Halleck for a month. From Sept. 1862 till May 1864 he defended Charleston and then defeated Butler at Drury's Bluff. He surrendered with Johnston after the campaign against Sherman in 1865. After the war he refused commands offered him in foreign armies. *See* A. Roman, *Military Operations of General Beauregard*, 1883.

Beauregard-l'Evêque, a French com. in Puy-de-Dôme, is noted for an ancient building erected by the bishops of Clermont as a house of recreation. Pop. about 1200.

Beaurepaire, a French vil. on the Suzon and Auron rivs., 18 m. from Vienne. Silk-throwing is carried on, and there are tanyards and cutlery works. *Pop. 3000.*

Beau Seant, or Bauceant, a banner belonging to the Knights Templars in the 13th century. It was an oblong flag with the design in white and black.

Beausobre, Isaac (1659 – 1738), learned Fr. Protestant divine, studied at Samur, and expelled by Louis XIV. for preaching; went to Holland and Germany, where he was a great favourite with Frederic William I.; he lived at Berlin forty-six years. He wrote critical and historical work on the N.T., and his sermons were read long after his death.

Beausset, a Fr. vil. in the dist. of Var, 11 m. from Toulon. Earthenware is manufactured and there is a trade in oil, wine, and corn. Pop. 2200.

Beauty, that quality in visible objects in consequence of which their colours and forms are agreeable to the human mind. Though thus at first appl
sight
the
the other senses, *e.g.* the hearing. By

a further extension, the adjective *beautiful* has become merely a vague term of praise, synonymous with *admirable*, *e.g.* beautiful language, a beautiful metaphor, etc. *See* Æsthetics.

Beauvais, a tn. in N. France, and the cap. of the dept. Oise. It is situated at the junction of the Avelon and Thérain, in a beautiful valley. It is an anct. place, having been known to the Romans, who called it Cæsaromagus. Its cathedral, begun in 1247, is famous, and the stained-glass windows from the 13th to the 16th centuries are specially noted. The manufs. are tapestry, carpets, gold and silver lace, brushes, etc. Pop. 17,000.

Beauvoisis, or **Beauvaisis**, an old dist. of France, was formerly comprised in the government of Picardy, then of l'Ile-de-France. It now forms part of the arrondissement of Beauvais in the department of Oise.

Beaver, or *Castor*, is the name applied to a genus of rodents of the family Castoridæ. There are only two species, *C. fiber* and *C. canadensis*; the former is a native of Europe, and the latter of N. America. They are related to squirrels and prairie-dogs, and are noted for their great intelligence, their skill in building houses and dams, their glossy fur, and glands which secrete castoreum, used in medicine. In length they are about 1 to 2 ft., while the broad, flat tail is about another foot long: their feet are webbed. Their food consists of the bark of trees and occasionally they eat fruit. They live usually in large communities in burrows or lodges near the banks of a stream, for in habit they are aquatic. Bs. are of interest chiefly on account of their architectural ingenuity. To obtain wood, both for building and for food, they gnaw round the bases of trees until they fall, when they float them down stream to their houses. When the wood near home is exhausted they construct canals and dams so that they may bring into their power the wood beyond their reach at the time, and in this way whole tracts of land are deprived of timber and covered with water. The European Bs. seldom construct dams, but *C. canadensis* by its construction does much damage. Their houses, or *lodges*, are built on the banks of streams or on small islands, and are made of twigs, moss, and grass plastered together with mud, and the entrance passage is often protected by piles of sticks. The B. is frequently hunted on account of its fur, the fatty castoreum, and its flesh —especially that of the tail—and is consequently in danger of total extermination. *See* H. T. Martin's *Castorologia*, 1892.



BEAVER

Beaver, Sir Philip (1766-1813), Eng. naval captain. At the age of eleven he accompanied Captain Joshua Rowley in the *Monarch*. He joined a scheme of colonisation in Bulama Is., near Sierra Leone, but the venture proved disastrous. He took part in the bombardments of Genoa in 1800.

Beaver Dam, a tn., Dodge co., Wisconsin, U.S.A. It is situated on B. Lake, 65 m. W. of Milwaukee. Its manufs. are wool, cotton, metal goods. Wayland Academy is a Baptist college in the town. Pop. 5615.

Beaver Falls, a tn., B. co., Pennsylvania, U.S.A.; it lies 32 m. N.W. of Pittsburg on a plateau above the *B. riv.* It has a large manuf. of iron and steel goods of all descriptions. The Presbyterian 'Geneva' College is now at College Hill close by. Pop. 10,246.

Beaver Rat, the name given in Australia to the native water-rat of the genus *Hydromys*, family Muridæ, and order Rodentia. These small mammals are related to voles, hamsters, and lemmings.

Beaver Tree, sweet-bay, or swamp-laurel, the *Magnolia glauca*, growing in swampy ground from Massachusetts to Florida. It has evergreen leaves and round fragrant white flowers.

Beawar, a tn. of British India. It is situated 30 m. from Ajmere, and is a centre of the raw cotton trade. Pop. 21,928.

Beazley, Charles Raymond, Eng. geographer and historiographer, was born at Blackheath, April 3, 1868. He was educated at London and Oxford, being made a fellow of Merton College in 1889. Of his numerous publications the following may be named: *James of Aragon*, 1890; *Dawn of Modern Geography* (3 vols.), 1897, 1901, 1906; *John and Sebastian Cabot*, 1898; *Voyages of Elizabethan Seamen*, 1907.

Bebeerine, or **Bibirine**, an extract of the bark of the greenheart, *Nectandra rodbiaei*, of Guiana, the native name for which is *bibiru*. Its efficacy as a tonic and febrifuge was discovered in 1835 by a doctor in Demerara, Hugh

Rodie, and its properties chemically analysed by Sir D. Maclagan, 1841. The expectation that it would form a substitute for quinine has not been fulfilled.

Bebek, a bay and small tn., on the W. shore of the Bosphorus, some 6 m. from Constantinople. An 18th century palace of the sultan's overlooks the beautiful bay.

Bebel, Ferdinand August, German socialist and leader of the Social Democratic Party, was *b.* at Cologne, 1840. He worked as a turner at Leipzig, joined the Working Men's Assoc., 1863, and became a socialist, 1865. In 1867 he was elected to the N. Ger. Reichstag and to the united Ger. Reichstag in 1871, of which he has since remained a member. He with Liebknecht opposed the war in 1870, and in 1871, as the only socialist member, the annexation of Alsace. In 1872 he was imprisoned for high treason. With Liebknecht he organised the Social Democratic Party and joined his staff on the *Vorwärts*, 1890. His great oratorical powers gave him a commanding position in his party, which has survived the attacks of the more violent 'young' socialists on one hand and the 'revisionists' on the other. He has remained leader of the parl. socialists and a confirmed adherent to Marxian principles. His chief publications are *Unsere Ziele, Die Bauernkrieg, Christentum u. Socialismus*, and his attack on bourgeios marriage, *Die Frau u. der Socialismus;* and an Autobiography (1912).

Bebre, a Fr. riv. which rises in the dept. of Loire, and drains the S.E. of the dept. of Allier. After a course of 47 m. it enters the R. Loire.

Bec, Abbey of, a Benedictine abbey, of which only the ruins remain, near Bernay, Normandy. It was founded by Herlwin or Herlewin in 1034. Under Lanfranc as prior and Anselm, prior and abbot, it became the centre of learning in Europe.

Beccafumi, Domenico, a celebrated painter of Siena. According to Vasari he was born at Siena in 1484, and died there in 1549. His real name was *Mecherino;* that of B. he derived from his patron Lorenzo B. He painted in distemper, and in oil; better in the former style, and his small figures are superior to his larger ones. His best works are in Siena.

Beccaria, Cesare Bonesana, Marquis of (1735-93), an Italian writer on moral and political philosophy; a student and in a manner imitator of Montesquieu; pub. a work on the monetary abuses in Milan; he edited a paper, *Il Caffé*, after the manner of the *Spectator*. His best known work was *Crimes and Punishments*, a work singularly in advance of his time, but so far in advance that while he raised at the time a furore in Europe, he is now, like Jeremy Bentham, not read at all. In 1768 the Austrian gov. founded a chair of political philosophy for him at Milan. He died of apoplexy.

Beccaria, Giovanni Battista (1716-81), *It. electrician, born at* Mondovi; studied theology at Rome, and was professor of philosophy at Palermo. In 1748 the King of Sardinia appointed him to the chair of natural philosophy at Turin. He pub. various works on electricity; elected a fellow of the Royal Society, London, 1755.

Beccles, a municipal borough and mrkt. tn. in Suffolk, England. It is *situated on the* r. b. of the Waveney, which riv. is navigable to Yarmouth. The tn. is 110 m. from London. There are brickyards, malting works, and manufactures of earthenware. Pop. 7000.

Becerra, Gaspar (1520-70), Spanish painter and sculptor. He was a native of Baéza in Andalusia. He studied, it is reputed, under Michelangelo in Rome. *Philip II.* had many of the rooms of his Madrid palace painted by him. Of his sculpture the finest example of his work was 'The Virgin,' which has been destroyed.

Bec-fin, the Fr. name for various warblers of the family Turdidæ. It includes such thin-billed birds as the stone-chat and hedge-sparrow.

Beche, Sir Henry Thomas de la (1796-1855), geologist. He was born in London and educated at a Devonshire grammar school. He entered military service, which ceased at the peace of 1815. Henceforth he devoted himself to the study of geology. He attained a great reputation by his geological map of England, in which he was assisted by the gov. He became president of the Geological Society in 1847.

Beche de Mer, often known by the Malay name *trepang*, or as 'sea-slug' or 'sea-cucumber,' a species of Holothurian echinoderms, about 5-12 in. long, either with smooth or warty skins. They are found chiefly off the coasts of the Eastern Archipelago and New Guinea and Queensland. First boiled and then dried in the sun and smoked, they form a chief part of the Chinese gelatinous soups, and are considered
a large trad

Becher, . . .
Ger. chemist and physician, born at Spires, became professor of medicine at Mainz; his *Physica Subterranea*, 1669, contain his experiments on various substances; Stahl's *Doctrine of Phlogiston is indebted to him* (ed. 1703). He died in London.

Bechstein, Johann Matthäus (1757-

1822), German naturalist, was born at Waltershausen in Saxe-Coburg-Gotha, and educated at Jena University. He devoted himself to the study of sylviculture with great enthusiasm, established a school of forestry in his native place in 1795, and was chosen director of the Academy of Forestry at Dreissigacker by the Duke of Saxe-Meiningen in 1800. His *Naturgeschichte der Stubenvogel* (1840) has been translated into English, and passed through several editions. *See* L. Bechstein's *Dr. J. M. Bechstein und die Forstakademie Dreissigacker*, 1855.

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which still bears his name, and whose instruments are famous for depth of tone.

Bechuanaland, geographically, occupies that portion of the central plateau of S. Africa between the Orange R. on the S., the Zambesi and Rhodesia N., the Transvaal E., and Ger. S.W. Africa W. Politically it is divided into British B., incorporated, 1895, with Cape Colony, area 51,424 sq. m.; pop. 84,210 natives, 9276 whites; and the B. Protectorate, area 275,000 sq. m., pop. 125,350 natives, 1692 whites, governed as a British Crown Colony by the High Commissioner represented by a resident commissioner. Its customs revenue is collected by the S. African Customs Union. The excess of expenditure, now decreasing, over revenue, derived principally from a hut-tax, is covered by an annual imperial grant. A portion of Matabeland, the Tati concession, is attached to the Protectorate.

The western portion of B. is occupied principally by the Kalahari desert, where big game still abounds; the E. is veldt-land, affording pasture for the cattle, the chief wealth of the natives, though millet and maize and some wheat is grown. The climate is good except in the marshy dists. round Lake Ngami in the Okavango basin, N.W., and in the Makarikari salt marshes, N.E.; the rainfall ranges from 10 in. W. to 26 in. E.; the soil is fertile but needs irrigation. Gold is found in the Tati concession and near Mafeking, and diamonds near Vryburg. Mafeking, in British B., is the headquarters of the Protectorate administration. The prin. tribes are the Bamangwato (35,000), Khama's people, [illegible]ortion of the N.E [illegible] chief tn. Serowe, removed from Palapye, 1903; Bakwena (13,000), Bakathla (11,000), Bangwaketsi (18,000).

History.—Exploration began at the end of 18th century; in 1818 the London Missionary Society settled at Kuruman, Robert Moffat's headquarters from 1821. Livingstone's systematic explorations commenced in 1841. After the Sand River Convention, 1852, the Boers began to encroach from the E. The appeals from the native chiefs, notably the Christian and enlightened Khama, during the seventies, led to a temporary British occupation. After the first Transvaal war, the Boers set up the republics of Stellaland (at Vryburg) and Goshen in the N., which they retained contrary to the London Convention, 1884. Sir Charles Warren's expedition, 1884, finally brought B. under British rule. The present administrative division dates from 1895. *See* G. W. Stow, *Native Races of S. Africa*, 1905; Livingstone, *Missionary Travels in S. Africa*, 1857; Moffat, *Missionary Labours in S. Africa*, 1842; J. D. Hepburn, *Twenty Years in Khama's Country*, 1895; *British Africa*, 1899; article by Sir S. Shippard, and *Bechuanaland Report*, Colonial Office.

Beck Case. The trial of Adolf Beck in April 1904 led to a very serious miscarriage of justice. Identified by several women and an ex-policeman as a certain man named Smith, who had previously been imprisoned for fraudulency, he was convicted of attempting to defraud these women again. While undergoing penal servitude he discovered that Smith was a Jew, and by personal marks he was at length able to prove his innocence. After scandalous delay he was pardoned and offered a sum of money as compensation for his imprisonment. Smith was arrested, and Beck died in poverty in 1909. *See* J. Kempster's *Perversion of Justice as exhibited in the Beck Case*, 1905.

Becke, George Louis, a novelist, *b.* in 1848 at Port Macquarie, New South Wales. His chief works are: *By Reef and Palm*, 1894; *The Ebbing of the Tide*, 1896; *His Native Wife*, 1896; *Wild Life in Southern Seas*, 1897; *Rodman the Boatsteerer*, 1899; *Tom Wallis*, 1900; *Edward Barry, Boy Rock and Pool, Yorke the Adventurer*, 1901; *Breachley, Black Sheep*, 1902; *Helen Adair*, 1903; *Tom Gerrard*, 1904; *Notes from my South Sea Log*, 1905; *Sketches from Normandy*, 1906. He has also written the following works in collaboration with Walter Jeffery: *A First Fleet Family*, 1896; *Pacific Tales*, 1897; *Naval Pioneers of Australia*, 1899; *Admiral Phillip*, 1899, and *The Tapu of Banderah*, 1901.

Beckenham, a tn., Kent, England. It is a residential district for London, stretching from the Crystal Palace to Bromley. Shortlands is in the parish. Pop. 26,331.

Becker, Ferdinand Wilhelm (1805-34), *b.* at Höxter on the Weser, where his father, Karl Ferdinand B., a distinguished philologist, practised as a physician. Educated at Göttingen, and in 1820 came to Scotland, where he was appointed assistant librarian in the Advocates' Library (*q.v.*). He moved about from Scotland to Germany, co-operating with Dr. John Thomson, the professor of pathology; he was appointed by the Russian gov. to make inquiries concerning the efficacy of vaccination; he died suddenly. His works include sev. Lat. treatises on medical subjects, and a pamphlet on *Cholera*, pub. in London. He wrote for many periodicals in France, Germany, and England, and did sev. articles for the famous *Penny Encyclopædia*.

Becker, Karl Ferdinand (1775-1849), Ger. philologist, born near Trier, estab. a school at Offenbach, 1823. His principal work, *Ausfuhrliche Deutsche Grammatik*, 1836, was long popular.

Becker, Lydia Ernestine (1827-90), an advocate of women's suffrage. She was appointed secretary to the Manchester Women's Suffrage Committee, 1867, and she continued to serve as secretary when this committee was merged in the Manchester National Society for Women in 1868. She also edited the *Women's Suffrage Journal*, 1870-90.

Becker, Wilhelm Adolf (1796-1846), classical archæologist, born at Dresden, studied under Beck and Hermann at Leipzig University, and became p ere in 1842. *Iand-buch de* 1843, finishe and Mommsen, but his most popular books are the scenes of Rom. and Gk. life, in the form of romances, *Gallus*, 1838 (new ed. 1880), and *Charicles*, 1840, (new ed. 1877), both have been trans. into Eng. He died at Meissen.

Beckerath, Hermann von (1801-70), Prussian statesman, born at Crefeld; gained great wealth from the bank which he founded, 1838; was a member of the Frankfort Parliament, 1848, and made finance minister. He was a leader of the movement for national unity under Prussian leadership. See *Life* by Kopstadt, 1874.

Becket, Thomas, chancellor of England and archbishop of Canterbury. He was born of Norman parents, his father, Gilbert Becket, being a well-to-do London merchant. Various stories have been related with regard to the person of his mother, the story most generally accepted being that she was a Saracen maid who followed her lover from his prison to the streets of London. There is, however, no historical basis for this story. He received his education at Merton Priory and in London, being also given a long course in knightly exercises and later being sent to Paris to study theology. He was attached to the court of Theobald, archbishop of Canterbury, and between the years 1148-53 he received a fairly useful training in the archbishop's court at the court of King Stephen. In 1152 the pope ordered Theobald to refuse the crown of England to Eustace, the son of having been it is said, of recognised as one of the leaders of Englishmen, and on the accession of Henry II. his promotion was expected and looked for. By the archbishop he had already been promoted and offices had been heaped upon him, and a year after the accession of Henry II. (1155) he was appointed to the chancellorship. His appointment was popular and was ora, to receive an appointment of this description since the Conquest. He was extravagantly magnificent during his period of office, and was far more regal in his manner of living than was the king himself. He was the head of an embassy to the Fr. court, he suggested a means of gaining the Norman Vexin, and he took an active and knightly part in the Toulouse campaign. All these things make it difficult to understand the complete change which came over him in 1162, when he was created archbishop of Canterbury. He changed his manner of living to that of an ascetic; he determined to support and claim full privilege for the church; and he became the zealous champion of the church against the king. Henry II. was anxious to break the power of the church, and especially to reduce the benefit of the clergy. By the Constitutions of Clarendon he attempted to do this, and although B. at first refused to consent to them, ultimately he gave a grudging consent. But B. and the king had shown too openly their antagonism, and from this time onwards they became open enemies. B. fled the country, his property was seized and the revenues of his sees were impounded. A claim was made then went to Rome, where he was reinstated by the pope to his archbishopric. In 1170 a reconciliation was patched up between himself and the king, and he returned to England. He received a magnificent reception from the people, but quarrels soon broke out again. The coronation of the young King Henry during B.'s

absence led him to excommunicate the bishops who had taken part in it. The news of this aroused the Angevin fury of Henry II., and he burst forth with the words that led to the murder of B. in Canterbury Cathedral by four of the king's knights. The murder took place on Dec. 29, 1170. B. was canonised in 1172.

Beckford, William (1760-1844), author of *Vathek*, the son of William Beckford (1709-70), Lord Mayor of London and supporter of Wilkes, was born at Fonthill Abbey, Wilts. He inherited a great fortune on his father's death. In 1783 he married Lady Margaret Gordon, daughter of the fourth Earl of Aboyne. B. had travelled already much on the continent, meeting Voltaire in 1777, and making the Grand Tour. After his wife's death in 1786 he went to Portugal. He was M.P. for Wells from 1784 to 1790, when he resigned, and for Hindon 1806. In 1801 he sold the contents of Fonthill, and began the building of a new house at a cost of nearly £300,000. His eccentric habits of seclusion here gave rise to various stories. In 1822 he sold Fonthill to Mr. John Farquhar, who sold his collection of pictures and art treasures; three years later the tower (260 ft. high) collapsed and destroyed part of the house. B. built another tower near Bath, where he lived till his death. The Oriental romance for which he is chiefly remembered, *The History of the Caliph Vathek*, was pub. in Fr. 1782, translated into English, 1786, and, as B. was wont to assert, was written at a single sitting of three days and two nights. This is cited by Borrow in support of his statement that he wrote the *Adventures of Joseph Sell* in about as many days (*see* appendix *Romany Rye*), but we may believe neither. His *Portuguese Letters* were pub. in 1834, and in the same year a reissue of his satirical *Biographical Memoirs of Extraordinary Painters*, originally written in 1780. *See* C. Redding's *Memoir*, 1859; R. Garnett's ed. of *Vathek*, 1893; and L. Melville, *Life and Letters*, 1910.

Beckman, Sir Martin, Eng. artist. He lived about 1656. He painted solely as an amateur.

Beckmann, Johan (1739–1811), author and professor, born at Hoya in Hanover, and educated at the Göttingen University. In 1762, he became a professor of natural history at the Lutheran Academy at St. Petersburg. In 1766 he received an appointment as professor at Göttingen, where he gave lectures on political and domestic economy. In 1772 he was a member of the Royal Society of Göttingen until 1783. His principal work was the *History of Invention*. He wrote *A History of the Earliest Voyages made in Modern Times*. This last he left incomplete.

Beckx, Pierre Jean (1795–1887), general of the Jesuits, was born at Sichem, in Brabant, and died at Rome. He became confessor to the Duke of Anhalt-Köthen, and procurator for the prov. of Austria in 1847. Six years later he was made general of his order, and as such greatly influenced Pope Pius IX. He took a prominent part in the discussions which were rife concerning the Immaculate Conception and papal infallibility.

Beckum, a tn. of Westphalia, Prussia, 23 m. S.E. of Münster; pop. about 7000.

Beckwith, John Charles (1789-1862), British general and missionary, born in Nova Scotia, was a nephew of General Sir Thomas B. (1772-1831), who gained distinction in the Light Division during the Peninsular War. John served in the Light Division during that war, and lost a leg at Waterloo. In 1827 the condition of the Waldensians in Piedmont turned him to missionary work. He settled at La Torre. He founded 120 schools and built a church and reintroduced Italian into their services. He died at La Torre.

Becman, John Christopher (1641-1717), Ger. historian and geographer, was born in Anhalt. He died at Frankfort.

Becon, Thomas, D.D. (1512–67), chaplain to Archbishop Cranmer; no knowledge of his education at school exists, though it is certain that he graduated as B.A. at the age of sixteen at St. John's College, Cambridge. His religious opinions caused his summons to London, there to recant them and further to burn the books wherein they had been proclaimed. During the reign of Edward VI. he prospered, only, however, to be sent to the Tower on the death of the king. His release ultimately followed, with renewed success on Elizabeth's accession. He died probably in 1567, though the date is by no means certain.

Becque, Henri François (1837–99), Fr. dramatist, born in Paris. Was for some time a banker, and served on the editorial staff of sev. papers. His plays, which met with varying success, include the opera *Sardanapale*, 1867; *Michel Pauper*, 1870; *L'enlèvement*, 1871; and *Parisienne*, 1885.

Bécquer, Gustavo Adolfo (1836-70), a Spanish poet and man of letters, the son of an artist, Joaquin B. In 1856 he went penniless to Madrid, and earned a scanty living on translations and miscellaneous journalistic work. He wrote three vols. of poems and

prose legends. In the former he was obviously imbued with the romantic spirit that so strongly influenced Byron and Heine; his prose legends are weird and somewhat morbid. *See* his *Obras*, ed. by Correa, with a biographical introduction (Madrid, 1885; 5th edition, 1898).

Becquerel, Antoine César (1788-1878), Fr. physicist, born at Châtillon-sur-Loing; served with the Engineers in Spain, 1810; he was appointed to the Ecole Polytechnique and served in France in 1814. He then left the army and began to study with Ampère and Biot magnetism, electro-conductivity, and more particularly electro-chemistry. In 1837 he became professor of physics at the Musée d'Histoire Naturelle. The value of his researches in electrical science was recognised by the Royal Society with the Copley medal, 1837, and he may be regarded as one of the pioneers in the study of electro-chemistry. He made valuable observations in meteorology and in animal heat and the growth of plants. Of his numerous scientific publications the chief are *Traité d'électricité* [illegible]'0; *Eléments de* *Traité complet* ; *Eléments de physique terrestre et de météorologie*, 1847.

Becquerel Rays are so called because they were the discovery of Antoine Henri B. (born in Paris, 1852), grandson of Antoine César B. (*supra*), who first recognised the property of radioactivity in uranium.

Beese, or O Beese, a tn. of Hungary, situated on the r. b. of the Theiss; has a large trade in grain; pop. 19,000.

Becskerek, or Nagybecskerek, a tn., Torontal co., Temesvar Banate, Hungary. It is an important centre of trade in cattle and wheat, and is on the Bega R. and Bega Canal, by which it is joined to Temesvar, 45 m. distant. Pop. 26,000.

Bective Abbey, which is 5 m. from Trim in Ireland, was an ancient building situated on the R. Boyne. In later times a church was erected on the site of the ruined abbey, and the steeple of the church still remains.

Bed. Primitive man made his bed upon the floor of a cave or hut of skins, of leaves, of ferns, of dried grass or straw, and so does his fellow, the savage of to-day. Eastern nations still pile their sleeping mats and rugs on the floor for night, and remove them in the day. The bed of the O.T. and N.T. can be seen to-day in the E. In India the *string bed* stretched on a low framework of wood, the 'charpoy,' seems to mark a transition towards the bedstead. The material of the bedding, straw, wool, or feathers, has not varied much since early times; hair was used in the middle ages. The coverings have always been the object of lavish display in material and decoration. Pillows and bolsters were used in anct. Greece and Rome. The curved head-rest of wood or more costly material is found in anct. Egypt, and to-day in Japan, in Africa, and the Pacific. In modern times flock, wool, horsehair are used for the stuffing of bedding; feathers, still used for pillows, have ceased to be a luxury for the bed; the spring mattress has given place to the coiled wire-woven net, fixed in the framework, a development of the crossed plats of iron or webbing descended from the hide thongs of anct. times which supported the bedding. The 'bedstead' proper in Egypt was a low framework of wood, on which was stretched a webbing of rushwork or fibre; more lofty beds, with steps, were used for persons of rank. The early Gk. bed had a head-board, and laced thongs of hide bore its pile of skins or other coverings. Oriental influence brought carving and inlay of metal and ivory, which the Romans copied. At Pompeii have been found the carved bronze posts and head-rests of beds which once supported a narrow frame of wood; such were probably placed in an alcove and sheltered by curtains. In the early middle ages the bedstead, where used, appears to have been a box-like construction, but there are illustrations in MSS. of beds with carved and decorated head- and foot-boards; others are mere couches or benches placed against the wall with curtains hung from a side cornice. A feature of 12th and 13th century beds is their slope from head to foot. In the 14th century is found the 'tester,' with canopy and side curtains usually hung from a wall-projection at the head. It must be remembered that bedsteads were luxuries for the well-to-do, and that the common folk slept, as did their ancestors, on rushes, skins, or straw upon the floor. Till the end of the 15th and beginning of the 16th century most of the decoration seems to have been lavished on the bed-trappings, which a great personage carried with him, to furnish the light frameworks of the permanent bedsteads. With the 16th century comes the great four-post bed, with its opportunity for the craft of the wood carver. Many fine examples of Elizabethan and Jacobean beds of this type still exist. An historic example is the great bed of Ware, once at the Saracen's Head, now at Rye House.

With the end of the 17th century a return was made to the 'tester,' but the canopy and side curtains rest on the head-posts of the bed, and the foot-board, carved and curved, remains or is dispensed with. France was before England in the change, and the 18th century in France produced the most ornate and beautiful examples. Chippendale and Sheraton designed fine mahogany bedsteads, and the present day has seen a revival of the taste for wooden bedsteads in preference to the iron and brass bedsteads which had come into almost universal use since the middle of the 19th century.

Bed, in geology, is a term used to indicate the layers of certain rocks, usually called strata (*q.v.*).

Beda, *see* BEDE.

Bedarieux, a tn. of S. France, in the dept. of Hérault. There are manufs. of wool and cloth, and also tanneries and distilleries. Pop. 5500.

Bedchamber Question, *see* HOUSEHOLD, ROYAL.

Bedda, or Beda, Nuts are the product of *Terminalia belerica*, a species of Combretaceæ. These tropical seeds are used in medicine, and also in dyeing and tanning. In common with the seeds of sev. other plants they are called *myrobalans*.

Beddard, Frank Evers (*b.* 1858), an English naturalist. Prosector to the Zoological Society since 1884; formerly lecturer on biology at Guy's Hospital, and examiner in zoology and comparative anatomy at the university of London, and of morphology at Oxford. He was also naturalist to the *Challenger* Expedition Commission, 1882-84. His works are: *Animal Coloration*, 1892; *Text-book of Zoogeography*, 1895; *A Monograph of the Oligochæta*, 1895; and *Structure and Classification of Birds*, 1898.

Beddgelert, *i.e.* 'the grave of Gelert,' vil., Carnarvonshire, N. Wales, 13 m. S.E. of Carnarvon. It is close to the Pass of Aberglaslyn, in which is the rock called 'the chair of Rhys Goch,' the bard (*d.* 1420). From the vil., lying at the foot of Snowdon, the ascent can be made. Pop. 1200. The traditional grave of Llewellyn's hound, Gelert, well-known from W. R. Spencer's verses, is marked by a stone. The legend of the hound who saved his master's child from a wolf and was killed in mistake by the father is paralleled by the mediæval tale of a snake, a greyhound, and a knight (*Seven Wise Masters of Rome*), and by an Indian tale of an ichneumon and a snake.

Beddoe, John (1826–1911), anthropologist and physician, *b.* at Bewdley, Worcestershire, England, was educated at University College, London, and Edinburgh. He served during the Crimean War as a doctor on the civil staff, and from 1857 had a large medical practice in Clifton, Bristol. His chief anthropological works include *The Races of Britain; Stature of Man in British Isles; Anthropological History of Europe;* and *Colour and Race*.

Beddoes, Thomas (1760-1808), a distinguished physician, born at Shifnal, in Shropshire. Entered at Pembroke College, Oxford, 1776, and studied languages, chemistry, and geology. Came to London, 1781, and studied medicine under Sheldon. He took degree of Doctor of Medicine at Oxford, 1786, and visited France in the following year. At the outbreak of the Fr. Revolution, he supported the rebels, and with such publicity that his stay at Oxford was no longer possible. He returned to Shropshire, and wrote the *History of Isaac Jenkins*, intended to check drunkenness. In 1794 he married a Miss Edgeworth, sister of Maria of that ilk, and took great interest in the study of chemistry; he was instrumental in bringing out Humphrey Davy. He wrote several books on medicine.

Beddoes, Thomas Lovell (1803-49), English poet, born at Clifton, the son of Thomas B. (1760-1808), the physician and inventor of a 'pneumatic' system of therapeutics by inhalation of medicated gases. His mother's sister was Maria Edgeworth, the novelist. His poetic drama, *The Bride's Tragedy*, 1822, is modelled on the macabre plays of Webster and Tourneur, and his verse re-echoes that of the Jacobean dramatists. His fantastic and amorphous drama in verse, *Death's Jest-Book, or The Fool's Tragedy*, was pub. posthumously, 1850, by his friend, T. F. Kelsall, who was his literary executor, and in 1850-51 pub. a memoir of B. and collected eds. of his poems. Many of B.'s lyrical poems are exquisite, as, *e.g.* 'If thou wilt ease thy heart,' and 'If there were dreams to sell.' From 1824 till his death B. lived a wandering life abroad, chiefly in Germany and Switzerland, but his violent revolutionary views prevented his remaining long in one place. He committed suicide under peculiar circumstances in 1849 at Basel. *See* E. Gosse, *Poetical Works of T. L. Beddoes*, Temple Library, 1890, with the first full account of his life; *Letters*, 1894; and R. Colles, Muses Library, 1906.

Bede, Beda, or Bæda, surnamed The Venerable (*c.* 673-735), the greatest name in the history of A.-S. literature, was born in the territory of the monastery of St. Peter at Wearmouth. When seven years old he was ad-

mitted to this monastery, and studied under the famous abbot, Benedict Biscop, and his successor, Ceolfrid. In 682 Benedict Biscop had founded the neighbouring monastery of Jarrow, and it is here that B. generally resided. In his nineteenth year he was admitted to the diaconate by St. John of Beverley, then Bishop of Hexham, and eleven years later the same bishop ordained him priest. At the end of his *Ecclesiastical History*, B. gives us these particulars of himself, and goes on to mention how the observance of the monastic discipline, the daily charge of singing in the church, and the delights of learning, teaching, and writing had made up his holy and tranquil life. His learning was great, covering almost all the subjects then known, Latin, Greek, astronomy, medicine, and probably some Hebrew. His best known work is the *Historia Ecclesiastica Gentis Anglorum*, on which we depend for

scientific works, including a treatise on the calendar, and various other historical essays, such as the *History of the Abbots*, of his own monastery. Another large division of his work consisted of theological treatises and Biblical commentaries. A collected edition of B.'s works was first published at Paris 1544. The best is that by Dr. Giles, 1843-44. *See also* various editions at Paris, Basel, Cologne, and C. Plummer's *Opera Historica*, Oxford, 1896. An English translation of the *Ecclesiastical History* is published in the Everyman Library (Dent).

Bedeau, Marie Alphonse (1804-63), Fr. general, born and died at Vertou, near Nantes. He was sent to Algeria in 1836, and in 1847 became its governor-general for some time. During the revolution in 1848 he was appointed, by Marshal Bugeaud, commander of one of the five columns for its suppression, but proved of little service. He was arrested with Cavaignac and La Moricière in 1851 and banished, but in 1859 returned to his native land, where he lived in great seclusion until his death.

Bedegar, or **Bedeguar**, a Persian word meaning 'wind-brought,' used of a spongy gall, found chiefly on the wild rose, and especially on the sweet briar. It is covered with a mossy growth which is really undeveloped leaves. The gall-insect which produces it is *Rhodites rosæ*. *See* GALLS.

Bede-House, term used for an almshouse. *See* also BEDESMAN.

Bedel, or **Bedell**, the title of certain officials in Oxford, often called beadles (*q.v.*).

Bedell, William (1570-1641 or 42), Bishop of Kilmore, *b.* at Black Notley in Essex. Entered holy orders and was chosen fellow of his college, Emmanuel, Cambridge; was chaplain to Sir Henry Wotton at Venice. On his return to England he trans. into Latin various works concerning the history of the Church. In 1627 he became provost of Trinity College, Dublin, and in 1629 was elected Bishop of Kilmore and Ardagh; he fought the Catholics in a novel manner, by converting the better among their priests; he aided in the translation of the Prayer Book and Bible into Erse, and diligently saw that the translation was read in his diocese. At the outbreak of the rebellion in 1641 he was unmolested at first, but was afterwards imprisoned; he died in consequence of this. The translation of the N.T. was pub. at Dublin, 1602. *See* Burnet's *Life of Bedell*, 1685.

Bedesman, or **Beadman**, a person who resides in a bede-house, or is supported by funds appropriated for this purpose. *Bede* is the A.-S. word for 'prayer,' and bedesmen are so called because they were under an obligation to pray for the soul of the founder of their institution.

Bedford is the co. tn. of Bedfordshire, England, and a parl. and municipal bor. It is situated on the riv. Ouse, amid fertile pasture lands and corn-fields, about 50 m. from The nt as large parks. There is considerable trade in market garden and agric. produce. Engines and manufactured, a very old indt (*d.* 1573), one time Lord Mayor of London, is buried in St. Paul's Church. He did much to benefit B., his native place, and endowed an Edward VI. grammar school, and the 'Harpur Trust' supports a modern and other schools for boys and girls. The name of John Bunyan is associated with the town. He was born here, and also imprisoned in the jail; his chair is preserved, and the Bunyan Meeting House is on the site of the chapel in which he preached. B. returns one member to parliament. Pop. 35,000.

Bedford College, a school of the London University, was founded in 1849 by Mrs. Reid to provide a liberal education for women. In 1878 the London University admitted women to degrees, since which date the majority of students at B. C. have read for a university degree in arts or

science (pass or honours), although a general course of advanced study may be chosen. There is also an art school and a training dept. The latter was estab. in 1892 mainly for the purpose of training graduates for the teacher's diploma of the London University. The present buildings are in York Place, Baker Street, but new premises overlooking Regent's Park are being erected, which, it is expected, will be opened early in 1913.

Bedford, Dukes of, *see* RUSSELL.

Bedford Level is a dist. in England of about 400,000 ac., situated in the counties of Suffolk, Norfolk, Lincoln, Cambridge, Northampton, and Huntingdon. It was once fenland, and was in the first place drained by the Earl of Bedford in 1634. A large portion is under cultivation, and coleseed and flax are grown. Wild fowl live in the more marshy dists. in vast numbers. These are largely sent to the London markets.

Bedfordshire is a S. Midland co. in England, bounded by Northampton on the N.W., Bucks on the W., Bucks and Herts on the S., by Herts and Cambridge on the E., and Huntingdon on the N.E. Its area is 461 sq. m. The surface is generally level; a branch of the Chiltern Hills crosses the N.E. and S. The Great Ouse flows through the centre to the E., and is navigable to King's Lynn from Bedford, the co. tn. The Ivel, a feeder of the Ouse, is also navigable. The valley of B. is fertile, and the Ouse valley is noted for its rich pasture-lands. Wheat is largely grown, and also barley, turnips, onions, cucumbers, etc. Great numbers of sheep are reared in the S. The manufs. are lace-making and straw-plaiting at Luton and Dunstable, and agric. machines and tools at Bedford and Luton. There are limestone quarries in the co. Sev. relics of Roman times and parts of Roman roads are still to be seen in various parts. The co. is divided into 9 hundreds and 122 parishes, and returns two members to parliament. Pop. 171,249.

Bedlam (properly Bethlehem Hospital) is at the present time the London co. lunatic asylum, but was originally founded in 1247 as a priory at Bishopsgate, under St. Mary's of Bethlehem. It was afterwards converted into a madhouse, and transferred in 1676 to Moorfields, then in 1815 to Lambeth. At one time the inmates were treated in a terribly cruel manner, being exhibited as though they were wild beasts. Hogarth's picture refers to this.

Bedlam Beggars, or Tom-a-Bedlams, names formerly given to such patients of the lunatic hospital of Bethlehem as, being partially cured, were allowed to go at large. They were distinguished, says Aubrey in his *Remains of Gentilisme,* by having on their left arm 'an armilla of tin printed, of about 3 in. breadth.'

Bedlington, an urban dist. of Northumberland. It is situated 2½ m. above the mouth of the Blyth. It has collieries and glass works. Its pop. is 18,766 (1901).

Bedlington Terrier, so named after the tn. of B. in Northumberland. It was first bred there at the beginning of the 19th century, and was for some time only known to the miners of the district, with whom it was, as now, a favourite sporting-dog. It stands about 13 in. and weighs from 18 to 20 pounds; colour blue-black, with black nose, or liver, tan, or sandy with light-coloured nose; the coat is short, crisp, and inclined to harshness; the head is narrow, the muzzle long and powerful; ears set low, and falling close to the head; tail tapering and not carried high; the legs are long and flanks cut up. The B. is a splendid ratter, and full of courage and fight, with remarkable speed.

Bedloe's Island, in New York harbour, U.S.A., lying, together with Governor's and Ellis Islands, in the Bay S. of Manhattan Island. On it stands the famous statue of Liberty, presented to the nation by France, which dominates New York harbour.

Bedmar, Alphonso della Cueva, Marquis de (1572–1675), Spanish ambas. to Venice and cardinal. He was appointed to Venice, in 1607 to break up a league against Spain with France and the Netherlands. The plot that he was supposed to have planned, in 1618, with the Viceroy of Naples, the Duke of Ossuna, to capture the city during the ceremonies of the marriage with the Adriatic, is the basis of Otway's tragedy, *Venice Preserved.* He left Venice on its discovery and went to the Netherlands as president of the council. He became a cardinal in 1822, and bishop of Oviedo, where he died.

Bedminster, a post-tn. of Somerset co., New Jersey, about 15 m. S.W. from Morristown; pop. 2000.

Bednore, Bednur, or **Nagar,** a tn. of Mysore, British India, about 150 m. N.W. of Seringapatam. At one time a prosperous city, it is now little more than a village.

Bed of Justice was originally the throne of the Fr. king, when he was present at the sitting of parliament. The term signified an occasion when the king overruled parl. decisions, on the principle that his authority was paramount to that of his parliament, since the latter was his delegate. Louis XVI. held the last 'B. of J.' in 1788, and on that occasion he

ordered the whole parliament to be imprisoned.

Bedos de Celles, Dom François (1706-79), Benedictine monk of St. Maur, was born at Caux. He was a master in the knowledge of organ-building, and pub. *L'art du facteur d'orgues* in 1766 to 1778.

Bedouins, *i.e.* the people of the open land or desert, Arab *ahl-bedw, bada-win*, or as they also call themselves, *ahl-beit*, the people of the tent.

as distinguished from the pure Arab descended from Shem; thus the latter are the agricultural settled Arabs, the B. the nomad pastoral people. The earliest home of the B. was Northern Arabia, Hejaz, and Nejd, from whence they spread in early times to Syria and Mesopotamia, and to Egypt and Tunisia. The name has lost much of its true racial significance, for it is often applied to many Hamitic nomad tribes, such as the Bisharin and Hadendoas in Lower Egypt and the Soudan, while true B. have settled in vils. and become agricultural. Physically, the B. of N. Arabia is slight and wiry rather than strong, and below the middle height; in colour, brown, deepening in shade in the S. The features are good, with aquiline nose. Their organisation is tribal, their leader the 'sheikh,' chosen for his qualities, whether of wealth, birth, or courage. Living in tents and moving from well to well and pasture to pasture, the organisation is loose, and inter-tribal feuds are common, with constant cattle raidings. They are notorious plunderers of caravans and travellers, and a regular toll is paid by the Turkish gov. to these tribes through whose ter. pass the pilgrimages to Medina and Mecca. The building of the Hejaz Railway has caused much disturbance in consequence among the tribes. Regarding all travellers as trespassers, they respect a safe conduct or passport which can be obtained by payment from a sheikh. The proverbial Arab hospitality is then freely extended. Though professing Mohammedanism, they are by no means strict observers, except under pressure from the Wahabis, as in Nejd. Among remote tribes pagan pre-Islamic cults are said to continue. Polygamy is rare, but the marriage tie is loose. The dress of the men consists of a long skirt and a black camel's-hair cloak, with a black or striped headcloth; the women wear white trousers and skirt, with a large blue cloak which they draw over the face before strangers. The chief authorities are J. L. Burckhardt, *Notes on the Bedouins and Wahabis*, 1831; C. M. Doughty, *Arabia Deserta*, 1882; W. S. Blunt, *Bedouin Tribes*, 1879; Lady Anne Blunt, *Pilgrimage to Nejd*, 1881; Hill Gray, *With the Bedouins*, 1890; S. M. Zwemer, *Arabia, the Cradle of Islam*, 1900.

Bed

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pressure on one surface. The pressure causes a loss of vitality to the surrounding tissues through stoppage of the circulation, and results, if neglected, in a discoloration of the skin, then a slough, and finally a deep ulcer. The parts most liable are the base of the spine, the hips, shoulders, heels, and elbows, and the back of the head. The tendency to rapid formation of B. varies with the weight of the patient, his capacity to move, etc., but want of cleanliness, the wetting of bedclothes and bedding from perspiration and excretions, ruckled or untidy sheets are the chief exciting causes. A patient should, therefore, be frequently examined, kept scrupulously clean, and washed with soap and water daily, all damp clothing at once changed, the sheets kept smooth and the parts liable rubbed briskly; the skin on these parts should also be rubbed with methylated spirits, eau-de-cologne, whisky, or other stimulant, and dusted with boracic acid or prepared starch powder. Prevention of B. is thus a question of careful watching and good nursing, as is proved by their rare occurrence in a well-managed hospital. A water-bed or an air-cushion for the exposed parts is, of course, a good protection and of the utmost use if a B. has formed. The on-coming of a sore first shows as a dark red or purple patch, with some sensation of heat and irritation; the part should then be rubbed as before at least once every four hours; if the skin becomes abraded and a slough is threatened, hot fomentations of boracic should be applied four-hourly and all pressure removed by ringed air-cushions. Should a slough form, continued fomentations will bring it away, when the sore can be dressed with boracic ointment, or if persistent in not healing, friar's balsam, red lotion, or zinc ointment may be applied.

Bedstead, though applied originally to the place in which a bed was located, is a term now employed to indicate the framework of the bed. This frame may be made of iron or brass, which some years ago almost became universal, but wood is now superceding metal.

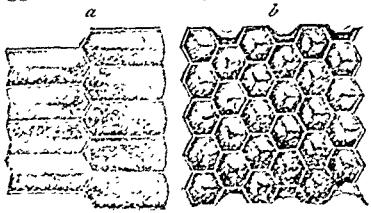
Bedstraw is a popular name of the genus of Rubiaceæ known as *Galium*,

and is related to woodruff and madder. The plants are herbaceous, the flowers are in panicles with small sepals and four petals, while the leaves and stipules are arranged in whorls, the latter being large and leaf-like. *G. Aparine* is often called goose-grass or cleavers; *G. verum* and *G. Mollugo* are common in Britain.

Bedwelty, a parish of W. Monmouthshire. It is situated 7 m. S.W. of Pontypool, and has a pop. of 10,000. It has coal mines and iron foundries.

Bedworth, a tn., Warwickshire, England, 5 m. from Coventry, on the Nuneaton-Coventry branch of L. and N.W.R. The Coventry Canal serves it for the carriage of its coal and ironstone mined there, and there are ironworks and brickfields. Pop. 6170.

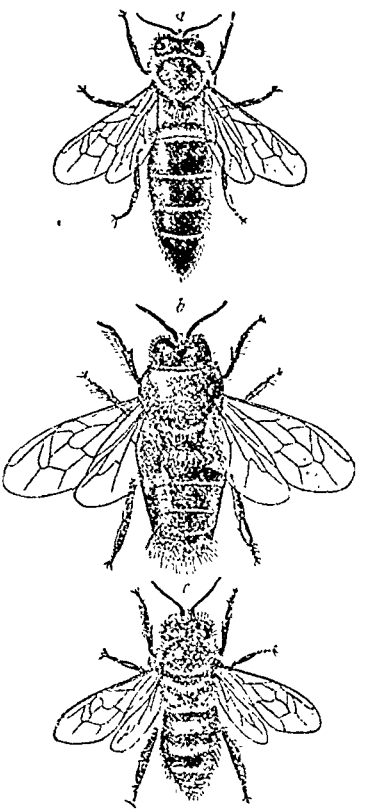
Bee is the name of the highest form of insect in the order Hymenoptera, which includes ants, wasps, saw-flies. ichneumon-flies, and many other creatures with four membranous wings, the thorax and abdomen fused, well-developed mandibles, and an ovipositor in the female. The Bs. themselves constitute the family Apidæ, or Anthophila, which is sev. times subdivided, and in addition to the above characteristics, they all agree in having the head united to the thorax, females with poisonous stings, males with antennæ divided into thirteen segments, females into twelve segments. In character they may be social or solitary, and the functions of life are divided among undeveloped females or workers, males or drones, and a highly-developed female or queen-B. There are about 1500 known species of Bs. exhibiting various degrees of specialisation and intelligence. As in every form of life, the chief interest centres in the reproduction of the species, and this is accomplished by the so-called queen-B. She is larger in size than her fellows, and permits no rival in her home, so that in each hive there is only one queen, and may be distinguished by the yellowness of the under part of her body, the absence of pollen-baskets and wax-pockets. Despite her short wings, she is capable of flying to a great height, and when she is pursued by her suitors, numbering probably 10,000, she rises in the air until all but one have failed to reach her. The object of the nuptial flight accomplished, the male falls dead to the earth, and the queen returns to her hive to renew her race. The eggs are laid in special cells prepared for workers, drones, and a few queens, and may be laid at the rate of about 3000 in one day. The eggs are bluish-white, about one-twelfth of an inch long, and hatch in about three days into worm-like larvæ. The young grub is fed by the workers for about five days on food previously masticated for them, then all receive unmasticated food but the future queens, which are fed on a specially-prepared *royal jelly*. The food is believed to affect greatly the reproductive system of the B., the poorer material stunting its growth in the workers, and the richer stimulating it in the queens; if, indeed, the hive requires a queen, a worker-grub is often carefully fed up on royal jelly until it actually develops into the superior creature. After a few days the grub has stored up sufficient food for a fast, the workers seal up its cell, it spins its cocoon and rests for a short time in the pupa-state. After about three weeks from the day of egg-laying, the imago breaks from the cocoon, is assisted by the workers in detaching and cleaning itself, rests for a day or two, then takes up its work in the hive, and its cell is utilised for another egg or for the storing of honey. The



WAXEN CELLS OF HONEY-BEE
a, in section; *b*, in elevation.

queen-pupa, however, is shut up and fed until her piping voice indicates that she has matured sufficiently, when she is released and immediately attempts to kill off all rivals. In the early summer the process called *swarming* takes place. A number of Bs., accompanied by the old queen, rush from the hive, fly for some little distance, then settle in a thick cluster on some object near by. They then proceed to make a new hive, the workers constructing combs from wax secreted in their bodies, and the queen is then able to deposit her eggs. At this stage of their existence the Bs. carry with them a great deal of honey from the previous hive, and they are so quiet that they may be handled almost with impunity. As the new queens appear in the old home they may lead off new swarms, as many as three occurring in one summer, which prevents over-population. It occasionally happens that a worker-B. produces eggs, but these invariably develop into drones, which merely increase the size of the swarm. The drones of the hive are males which

make a peculiar, dull sound when flying, and thus receive their name. They are also distinguishable by their large eyes and the extra segment of their antennæ. Beyond assisting in the fertilisation of the queen—in which, as has been shown, only one partakes—they appear to be of no value to the hive, and in the autumn the workers turn them out and kill them wholesale. The workers are provided with two peculiar structures, a *wax-pocket* situated under the middle joints of the abdomen, and a *pollen-basket*, which is a dilatation of a joint of the hind tarsi. Pollen is brushed into the basket by means of the numerous hairs on the legs, and furnishes the *B.-bread* necessary for the nutriment of the young. The honey is collected by the long, hairy tongue of the worker, and is stored up in the honey-bag until it is used as food or deposited in the comb. In times of scarcity, the honey-dew secreted by aphides is collected, and Bs. also gather a resinous matter known as *propolis* from trees to use it as cement in their hives. The poison is composed of a transparent fluid containing formic acid and other irritants, which remains in a venom-bag, and the sting is curved in such a way that if once used it is difficult of withdrawal, and frequently results in the death of the user. The life of a worker-B. is short, usually lasting for six weeks, and into this short space of time it crowds the honey and pollen gathering, the care of the larvæ, building and cleansing of the hive, and its ventilation by means of their wings when it has grown too warm. The queen-B. may live for three summers. The intelligence of the B. has, from the time of Aristotle, Virgil, and Pliny, been recognised as surpassing that of any other insect. As regards its senses, the sight is very highly developed, as well as the power of smell. It has organs of taste, and Lord Lubbock has proved the existence of its ability to hear; the antennæ are the highest organs of sensation. During the winter months it becomes torpid, its respiration is lessened, and it consumes little food, but in the spring the activity of its life is recommenced. The enemies from which it suffers are other insects, larvæ, and birds. The B.-louse, or *Braula cœca*, is a parasite which attaches itself to the thorax of a B.; the death's-head-moth, *Acherontia atropos*, also attacks the B.; the old world family of birds named Meropidæ consists of B.-eaters. Other creatures devour the larvæ, various lice infest the bodies of the different species, and even Bs. themselves are sometimes parasites in the hives of more industrious neighbours. The primitive B. from which others seem to be derived is the *Prosopis*, a weak and solitary form, with few hairs, unmodified hind legs, and a short proboscis; the nest is built in crevices in walls, and on bramble-stems. Another solitary genus is *Colletes*, which digs a burrow in the ground and forms a



HONEY BEES
a, female (queen); *b*, male (drone); *c*, unfertile female (worker).

colony in the mortar of walls. The *Sphecodes* include four British species, and seem to be sometimes parasitic, sometimes industrial. The *Andrena* is the largest genus, having over sixty British species; it burrows in sandy or gravelly soil, and appears in early spring. *Dasypoda* also digs holes in the earth, while *Halictus* lines its oval underground cells with a varnish which is probably formed from saliva.

The genera *Stelis* and *Nomada* are purely parasitic, the former laying its eggs in the cells of *Osmia*, the latter in those of *Andrena*. *Xylocopa*, a solitary B., is sometimes called a carpenter-B., from its habit of boring large holes for its cells in timber: in appearance it is very hairy, and it is amongst the largest species of Bs. *Chalicodoma* is a mason-B., which covers its eight or nine cells with a large dome. *Megachile* is the leaf-cutting B., which makes its cells of pieces of leaf joined together. *Anthidium* places its cells in empty snail-shells, and *Osmia* makes use of previously formed cavities. The chief social Bs. are well represented in Britain, by *Bombus*, the humble-B., and *Apis mellifica*, the honey-B., the habits of which have been described above. *Apis dorsata* is an Eastern B., which builds a comb five or six ft. in length; *A. Indica* is a native of S. Asia; *A. florea* inhabits the W. Indies; *A. Adansoni* is found in W. Africa. *See* Sir John Lubbock's *Ants, Bees, and Wasps*, 1882; E. Saunders' *Hymenoptera Aculeata of the British Islands*, 1896; Maurice Maeterlinck's *Vie des Abeilles*, 1901.

Beeberu, or *Nectandra Rodici*, is a tree belonging to the order Lauraceæ, growing in Guiana. The bark is medicinally important, and is known as *beeberu*, while the timber is called *greenheart* (*q.v.*).

Beech is the name of sev. species of *Fagus*, the typical genus of Fagaceæ. The common B., *F. sylvatica*, forms large forests throughout Europe, and is greatly valued for its wood, which is used in the manuf. of small articles, *e.g.* sabots and household utensils, but is of little value to the carpenter, as it readily rots when exposed to air. It is also of use as firewood, while the bark is employed in tanning, the catkins for packing, while the nuts yield a volatile oil, and are frequently used for fattening pigs. Although the trees may grow to a height of 100 ft., they are often grown in a stunted form, and clipped to make hedges. The flowers appear only every few years, the male flowers forming pendulous catkins, while the females grow in pairs within a mass of scales, which later develop into a cupule enclosing two nuts. The copper and purple Bs. are well-known varieties of *F. sylvatica*, and are noted for their bright-coloured leaves, as is the red B. of America, *F. ferruginea*. The evergreen B., *F. betuloides*, is known as the myrtle-tree in Australia; *F. obliqua* is the oblique-leaved; *F. fusca*, the New Zealand B.; the weeping B., fern-leaved B., and crested B. are the varieties *pendula*, *asplenifolia*, and *cristata* of *F. sylvatica*. Other trees known as Bs. belong to various other genera, and among them may be noted *Carpinus betulus*, white B., or hornbeam: *Exostemma caribbæum*, seaside B.; *Populus alba*, Dutch B., or white poplar; *Platanus occidentalis*, water beech.



BEECH

Beechdrops or **Cancer-root**, is a name given to the parasitic herb *Epiphagus Virginiana* of the order Orobancheæ. These plants are destitute of green foliage, and live on the naked roots of beech trees in N. America. Similar parasitic plants, such as *Albany* and *false beech-drops* belong to the order Ericaceæ.

Beecher, Catherine Esther (1800-78), the eldest daughter of Lyman B., was born at East Hampton on Long Is. She remained unmarried, having in early life been engaged to Professor Fisher, of Yale College, who was drowned at sea. Principal of a school in Hartford, Connecticut, from 1822 to 1832, she devoted her life to the advancement of education of women by organising societies and by her numerous writings on the subject.

Beecher, Charles (1815–1900), an American Congregational divine. The fourth son of Lyman B., and brother of Harriet Beecher Stowe. He read

name is applied to trees of two different genus—the Swartzia, belonging to the order Leguminosæ, in Guiana, and trees of the order Casuarinaceæ, in Australia.

Beehive House is a building, of primitive architecture, made of unhewn stones and without mortar, specimens of which are to be found in Ireland and W. Scotland. They consist of long stones laid down in a circle, and each course is overlapped by the one resting immediately above it, and with the circular roof it resembles a beehive in shape. From the 7th to the 12th century churches, priests' houses, and other buildings were formed after this fashion, and a cluster of them would frequently be surrounded by a stone wall for protection.

Bee-keeping was in practice among the ancients thousands of years ago, but it is only within the last fifty to one hundred years that it has been proved a source of profit to the agriculturist. It is no longer necessary for bees to construct their own hives and combs, and as wax is provided for them their labour in many directions is so much lightened that the output of honey has increased to an enormous extent. In former days 40 lbs. was considered to be an average amount collected, but now the average is doubled, and as much even as 400 lbs. has been obtained from a single hive. In the winter the surviving bees are usually allowed about 20 lbs. of honey for their use, and this may be supplemented by various syrups as they are required. In the spring they frequently need a small supply of extra food, but in the summer all that is required in this direction is that the hive should be placed in a spot surrounded by suitable flowers. In Scotland the hives are moved to localities in which heather is abundant, to obtain the rich dark heather-honey. During the spring, when the bees begin to swarm, the keeper is careful to prevent them from emigrating beyond his power. Usually when the cluster appears he covers it with a straw-skep, and when the various members have settled in it they are transferred to their new hive, but artificial swarming is sometimes used when a queen is placed in a new hive situated on the position of the old one. A swarm consists of about 40,000 to 50,000 insects. Modern B. owes much to the American clergyman, the Rev. L. L. Langstroth, who in 1851 produced a hive in which movable combs, built in frames, hung side by side. Later it was found that bees would use thin sheets of bees'-wax, called comb-foundation, stamped with an outline of the cell, if it were put near their hives. It has also been found possible to remove the honey from the wax without injuring the cells, by means of a rotating machine. Honey *sections* are also placed in hives so that the substance may be sold in a very marketable form. In obtaining honey the person about to extract it usually covers all unprotected parts of his body as a guard against stings. He then stupefies the bees with smoke, chloroform, or by some other means. *See* L. Langstroth's *Hive and Honey Bee*, 1889; F. R. Cheshire's *Bees and Bee-keeping*, 1888; F. Benton's *Honey Bee*, 1899; S. Simmins' *Modern Bee Farm*, 1893; A. B. Comstock's *How to Keep Bees*, 1905.

Beelzebub (the god of flies, from Heb. *baal*, lord, *zebûb*, fly), a Philistine god, whose temple was at Ekron. It is now thought that the word developed from Baal-Zebul, *i.e.* 'lord of the high house.' The Jews regarded all heathen gods as devils, and accordingly B. or Baalzebul appears in the N.T. as the prince of demons.

Beemster, a polder in N. Holland. It is situated 13 m. N. of Amsterdam, and has a pop. of 4000.

Beer, *see* BREWING.

Beer Acts. The sale of B. in England is under magisterial control, though in the early part of the 19th century licences could be obtained without application to magistrates. In 1869 the Wine and Beerhouse Act was passed, [illegible] By this Act a third of beerhouse premises, and a minimum value was fixed, based on the pop. of the neighbourhood. For the first hundred barrels the brewers paid a tax of £1, and on every additional fifty 12*s*. *See also* LICENCE and LICENSING LAWS.

Beer-Alston, a tn. in S.W. Devonshire, 8 m. from Plymouth, and situated on a height above the valleys of the Tavy and Tamar.

Beer-money was an allowance of one penny a day to soldiers of the British army in lieu of a supply of beer, instituted in 1800 and abolished seventy-three years later. It was also given to servants by householders instead of providing them with beer, to save trouble and waste.

Beeroth, the O.T. name for the modern Birch, a *vil.* in Palestine, 9 m. N. of Jerusalem. It had some importance as standing on or near the N. frontier of Judah.

Beersheba ('well of the oath,' or possibly 'seven wells') is, in ancient geography, a tn. in the extreme S. of Palestine, 50 m. from Jerusalem. The expression 'from Dan to B.' was indicative of its southerly position. The covenant of Abraham and Abimelech,

King of the Philistines, was made there. Its Arabian name is Bir-es-Seba, meaning 'well of the lions.' Very little of the old tn. is left now, but the two wells still remain, and they still contain a supply of water.

Beestings, or Beastlings, the name applied to the first milk taken from a cow or other animal after parturition. It is thicker and more yellow than ordinary milk. It has a larger percentage of albumin and salts in its composition, but not so much casein.

Beeston, a parish in the co. of Nottingham, and situated 3 m. S.W. of that tn. Its pop. is 4479, and it has manufactures of lace and hosiery.

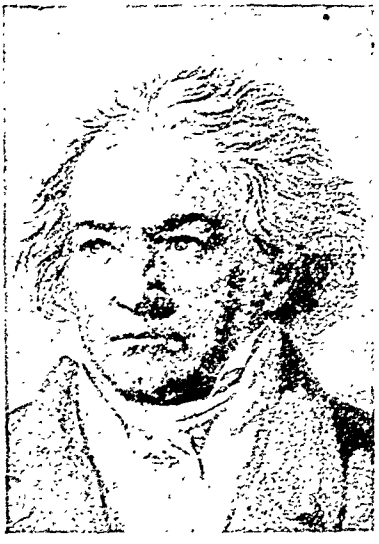
Bees'-wax, a substance produced by bees and used by them in the construction of the honey-comb. The wax is secreted by special glands in the abdomen of the bee, is pressed out between the segments of the body and moulded into roughly circular cells for the reception of the eggs and honey. It may be collected by draining off the honey and heating the residue in water, when it rises to the surface and solidifies on cooling. B. , for modelor effigies, niture, and ointments and plasters, on account of its unirritating quality. It is sometimes taken internally, when it acts as a protective to the gastric and intestinal surfaces.

Beeswing is a thin film as delicate as the wing of a bee, which appears sometimes as a crust on port and other wines, and indicates its age.

Beet is the name applied to sev. species of *Beta* (*q.v.*) of the order Chenopodiaceæ. The roots of many species are valued as a food, and *Beta vulgaris*, the common B., is used in the manuf. of sugar. *B. maritima*, sea or wild B., is eaten as a vegetable as well as *B. rubra*, the red beetroot. *B. cycla*, white beetroot, is cultivated for its leaves, which are eaten like spinach.

Beet-fly (*Anthomyia betæ*), an insect, so called because the maggots feed on beet leaves. The eggs are laid between the leaves. As soon as the maggots are hatched they begin to feed to the leaf round them and continue feeding for one month, when they turn to chestnut-brown pupæ. The flies come out a fortnight later and are grey in colour with black hairs. There is a brood in the summer and another in the autumn.

Beethoven, Ludwig van (1770-1827), Ger. musical composer, was of Belgian descent. His grandfather, Louis, left Antwerp in 1732 and settled in Bonn, where he became one of the archbishop-elector's musicians. His son (father of Ludwig) was a tenor singer at the court, but through drink and thriftlessness was always poor. The grandfather died when Ludwig was only four years old, but the latter, to whom he had been very kind, always cherished his memory. Ludwig's father taught him to play the violin and clavier; he displayed such wonderful precocity that at nine he had to be placed under more accomplished teaching. At twelve years of age he occasionally acted as deputy for the court organist, and at thirteen pub. his first composition. In 1784 he was appointed assistant organist to the court, and conducted the orchestra at the opera. Three years later, during a short visit to Vienna,

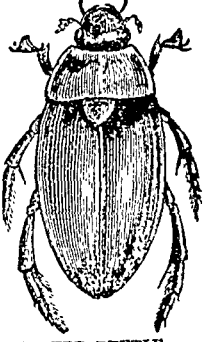


LUDWIG VAN BEETHOVEN

he played before Mozart, who was amazed at his talent in improvisation, and gave him a few lessons. For the next few years his life at Bonn was a trying round of hard work and responsibility; his mother died, and his father's habits became so disorderly that his salary had to be paid to Ludwig, who thus, at about nineteen, became head of the family. In 1792 the archbishop-elector (brother of the Emperor Joseph II.) sent him to Vienna to study under Haydn, with whom, however, he did not get on well. B. was clumsy in manner and speech, a great contrast to the brilliant Mozart, just dead, whom Haydn had intensely admired; thus Haydn treated the new-comer somewhat coldly, and he in return under-

valued his teacher. In spite of this he gradually worked his way by sheer hard work and brilliant genius, and in a few years was a 'personage' in the musical world of Vienna, in spite of an ungovernable temper and rude manners. For example, at the house of Count Browne, he was playing a duet with Ries, when a young nobleman in the room persisted in talking to a lady. B. stopped suddenly, saying loudly, 'I play no longer for such hogs:' nor would he allow Ries to do so. Of a suspicious nature, he was very insulting to those he suspected, even people of high rank. Haydn nicknamed him 'The Great Mogul.' Yet the aristocracy bore with it all for the sake of his genius. Princesses and countesses would forgive any rudeness, would receive his lessons wherever he pleased, and put up with his storming and tearing up their music if they were careless. He had no tact or discretion in matters of ordinary life; it was said of him that he was like a clever man brought up in a desert, and then suddenly turned loose into society. He was peculiar in appearance, 5 ft. 5 in. in height, broad shouldered, large headed, and ruddy in complexion. As a teacher he was impatient but very painstaking; in piano playing he was quiet, but extravagant in conducting. He was so absent-minded that he once insisted on paying a waiter for a dinner he had not had or even ordered. It must be said in excuse for his peculiarities that his early troubles had seriously affected his health and spirits. When he died, a post-mortem examination proved that he had suffered since childhood from an incurable disease aggravated by want of home comfort and good food, and later by unskilful medical treatment. His liver had shrunk to half its proper size, and there were serious ailments of old standing in the ears and pharynx. His family, too, tried him greatly; his father's character has already been mentioned, and his brothers, Johann and Caspar, the latter in particular, caused him endless trouble, and when the latter died, his son turned out worse still, in spite of all his uncle's self-denying endeavours on his behalf. In a pathetic document written by B. as far back as 1802, addressed to his brothers, he complains of the harsh judgments passed upon him by those who knew nothing of the years of suffering he had endured, and tells of the horrible dread which he felt of his growing deafness, which would incapacitate him for the enjoyment both of society and of his beloved art. This deafness in time became so complete that although he still played and conducted he heard nothing of the music. His finest works were composed after he had lost the power of enjoying them. His life ended sadly. In the winter of 1826-27 he was staying at the house of his brother Johann, and was taken ill. His brother would neither let him have a fire in his room nor give him the food he required, and at length sent him back to Vienna, during bad weather, in an open chaise; he took a severe chill, which brought on dropsy, and he died on March 26. As a musician B. stands alone. Other composers have been great, but not with a greatness like his. In his earlier work the influence of previous masters, especially Mozart, may be traced, but gradually he built up a style of his own, more and more noble as years went on. His total production is broadly divisible into three periods. In the first, although influenced by his predecessors, he already began to show such individuality that, for example, Haydn advised him not to publish his trio in C minor (Op. 1, No. 3), probably as being too daring for public taste. His second period, which included his *Sinfonia Eroica*, the *Leonore* music, *Egmont*, and the *Appassionata*, [illegible] merged his latter [illegible] which in grandeur of construction and polyphonic effect transcended anything previously achieved. To this period belong the *Sonata in B♭* (Op. 106), *Overture in C* (Op. 124), and other works of great force and beauty. The influence of B. on the form and growth of musical art has been immeasurable, and must be immortal. See *Beethoven*, F. J. Crowest, 1911.

Beetle is the common name of that order of insects which is technically known as Coleoptera. The species, which amount in number to about 150,000, have hard and horny fore-wings, usually with a straight suture between them when not in motion, which are very rarely absent in females, small hind-wings which alone function in flight, antennæ with a varying number of segments, biting



WATER BEETLE

mouth-parts, and the larvæ are grub-like. Bs. pass through a complete metamorphosis. Their food varies very greatly; some are fruit-eaters, some wood-eaters, while others live on dead animals, and a few are parasitic in habit. Different species are described under their particular headings, *e.g.* COCKCHAFER, LADYBIRD, WEEVIL.

Beetling is a process designed for the finishing of linen and cotton goods in which a beetling-machine hammers down the cloth by means of wooden stamps which rise in succession and fall by their own weight. This flattens the surface of the cloth and gives it a hard appearance.

Beets, Nicolaas (1814-1903), a Dutch poet and author, born at Haarlem. He was pastor of Heemstede, 1840; of Utrecht, 1854; professor of theology at the university of Utrecht, 1875-84. His reputation was built on his stories of Dutch life, by which he is chiefly remembered. His *Camera Obscura* (1st ed., 1839, under the pseudonym Hildebrand) is a classic, and has been translated into many European languages. The continuation, *Na Vijftig Jaar*, appeared in 1887. He also wrote critical and theological essays, of which *Stichtelijke uren* may be mentioned. His poetry was pub. in four vols. (1873-81), and includes *Guy de Vlaming*, 1853; and *Ada van Holland*, 1846. See *Nicolas Beets et la littérature hollandaise*, by J. J. Duproix, 1907.

Befana, a corruption of Epiphany. A legendary old woman who, being busy sweeping her house when the three wise men of the East passed on their way to offer gifts to the Infant Christ, excused herself from going to the window on the ground that she would see them on their return. The wise men returned another way, and B. was punished by being obliged to wait for them ever since. Her festival is held in Italy on Jan. 5, when her effigy is carried through the streets, amid great rejoicing. On Twelfth Night, It. children hang up a stocking before the fire, and B. brings to good children toys and sweets, but to bad children ashes. The tradition appears to be rather confused, for although she is the counterpart of Santa Claus, her name is used, like that of a bogey, to frighten naughty children.

Belfroi, Belfry, or Breaching Tower. a movable tower used in mediæval times during military sieges. It moved on wheels, was sev. stories high, and was usually covered with raw hides to protect the besiegers in the lower story from boiling oil and fire. The top story held a hinged drawbridge, to be let down upon the city wall for the landing of the assailants. Such a tower is mentioned by Cæsar and by Froissart.

Beg, or Bey (*cf.* Persian *baig*), a Mohammedan title given to the administrator of a dist. or tn., now used more generally as an honorific title, applied to officers and men of good family, throughout the Turkish empire. In Tunis it has come to be used as the hereditary title of the reigning sovereign.

Begarelli, Antonio (*c.* 1479-1565), a celebrated modeller in terra-cotta of Modena, where he was born. He was the friend of Correggio. There are few of the works of B. left; the prin. are the 'Descent from the Cross,' and a 'Pieta' at Modena, containing many figures in the round rather larger than life.

Begas, Karl (1794–1854), court painter to the King of Prussia, and professor in the Academy of Arts at Berlin, was born at Heinsberg and died at Berlin. He was famed as a portrait painter, and depicted many historical and biblical scenes.

Begas, Reinhold (*b.* 1831), German sculptor, son of Karl Begas the Elder. *b.* at Berlin, and studied there and in Rome. In 1866 he returned to Berlin, where he has spent the rest of his life. He has executed a large number of statues and architectural designs for public places, as well as numerous portrait busts. Among his best-known works are statues of Schilleo, 1863; Humboldt, 1882; Bismarck, 1901, and the Empress; statues on the Rukmeshalle at Berlin, in the Schlossplatz, Berlin, 1901; and on the Reichstag, etc.

Begbie, Harold (*b.* 1871), author and journalist. His works are: *The Political Struwwelpeter Series*, 1899-1901; *The Handy Man*, 1900; *The Adventures of Sir John Sparrow*, 1902; *Bundy in the Greenwood*, 1902; *Bundy on the Sea*, 1903; *Master Workers*, 1905; *The Priest*, 1906; *The Vigil*, 1907; *Tables of Stone, Racket and Rest*, 1908; *The Cage*, 1909; *Broken Earthenware, The Shadow, In the Hands of the Potter*, 1910; *Other Sheep, The Challenge*, 1911.

Begg, Alexander (*b.* 1840), a Canadian writer, born in Quebec. He took part in the N.W. Rebellion against Riel. Author of *The Creation of Manitoba; The History of the North-West;* and, in collaboration with W. R. Nursey, *Ten Years in Winnipeg: a Narration of the History of the Principal Events in the History of the City from 1870 to 1879 inclusive*, 1879.

Begg, James (1808-83), a Scottish Free Church leader, born at New Monkland, Lanarkshire; educated at Glasgow University. At the disruption of the Scottish Church (1843) he

belonged to the evangelical party and became leader of the constitutional party in the new Free Church. From this time till his death he was minister of the church of Newington, Edinburgh. He was strongly opposed to anything savouring of liberalism in theology and church practice—particulary the projected union with the United Presbyterian Church. He produced a considerable number of works on theological questions. Consult his *Life* by T. Smith (1885-8).

Beggar, a word of uncertain origin, which is used in speaking of a person *who asks alms, usually habitually,* and who generally lives on the money and goods which he thus receives. *See* such articles as MENDICANCY, POOR LAWS, and VAGRANT.

Beggar-my-neighbour, a game of cards, played by two or more persons. The players, holding their cards with backs upward, play down a card alternately, until one player turns up a court card, when his neighbour must pay him four cards for an ace, three for a king, two for a queen, and one for a knave, and in addition he wins the cards already thrown on the table and places them all under those in his hand. At the last one player obtains all the cards in the pack and wins the game.

Beghards, an association of men which was formed during the early part of the 13th century in the Low Countries, corresponding to and probably in imitation of the female Beguines (*q.v.*). Many vagabonds and mendicants adopted the title who did not belong to the brotherhood. They were denounced by the pope and councils, and suffered persecution from the Inquisition. Their communities had almost disappeared by the end of the 14th century.

Begharmi, Baghermi, or **Bagirmi,** a sultanate of Central Africa, S. of Lake Chad, and E. of Bornu, forming a large plateau, with an average alt. of 1000 ft., sloping gently to the N. The country is fairly fertile, affording pasturage to flocks of cattle. The inhab. are principally negroes, and the total pop. is estimated to exceed 1,000,000. The cap. is Masenya, the area of the country about 71,000sq.m.

Bégin, Louis Nazaire (*b.* 1840), a Roman Catholic archbishop, born at Point Lévis. He was educated at the Little Seminary of Quebec and at the Laval University, where he was awarded the Prince of Wales' gold medal in 1862, being the first to receive this prize. He was ordained in 1865 at Rome, where he remained to make a special study of eccles. history and Oriental languages, 1866-67. He was appointed prin. of the Laval Normal School, Quebec, 1885-88; bishop of Chicoutimi, 1888-91; coadjutor to Cardinal Taschereau, with the title Archbishop of Cyrene, 1891-8; and Archbishop of Quebec in 1898. He is the author of *La Primauté et l'Infaillibilité des Souverains Pontifes,* 1873; *La Sainte Ecriture et la Règle de Foi,* 1874; *Le Culte Catholique,* 1873; *Aide Mémoire ou Chronologie de l'Histoire du Canada,* 1886; *Catéchisme de Controverse,* 1902.

Beglerbeg, or **Beylerbey,** a Turkish word which signifies *bey of beys.* It was the term applied to the governor-general of a province who had under him several beys, and was second in rank to the grand vizier. The external distinctions were three ensigns consisting of staves trimmed with the tail of a horse.

Bègles, a tn. of dept. Gironde, France, on the R. Garonne, 3 m. S.E. of Bordeaux; pop. 12,061.

Begoniaceæ, a small order of tropical dicotyledonous plants, comprising four genera, of which *Begonia* is the chief. All the species of begonia have fleshy leaves, often richly coloured with crimson, succulent stems, and neat-looking pink flowers growing in panicles; the leaves are root-leaves, and have one side larger than the other—hence the name of *elephant's ear* sometimes given to the plant.

Beg-Shehr, or **Bei-Shehr,** a tn. of Asia Minor, 40 m. W.S.W. of Konieh. It is situated on both sides of a riv. of the same name as it enters Lake Beg-Shehr. The lake, which is also known as Kirili Geul, is about 35 m. long, and contains many islands; it discharges into a smaller lake, Soglah Lake, lower down.

Beguines are an order of sisters belonging to the Catholic Church, which was traditionally founded by St. Begga in 698, but, as now accepted, by a priest, Le Béghe, in the 12th century. They were first known in Holland and Germany. They took no vows, and they lived in close proximity in separate houses called 'beguinages.' Their houses often received large donations, which were devoted to charitable purposes. A hospital adjoined each institution, and frequently a church also. The sisters lived in great purity and poverty, giving their services in nursing, and tending the aged as well as educating the children. They were so useful that for a very long time they received sanction and shelter. The *sisterhood is still in existence in the* Catholic Church. The most famous of the institutions is at Ghent, under the name of St. Elizabeth's Beguinages. It consists of 100 small dwelling-houses, for the sisters, with a couple

of churches, and 16 convents. The sisters welcome the visits of strangers; they work among the poor and nurse the sick.

Begum (Hindustani *begam*, fem., from Turkish *beg*, lord), a name given to sultanas and to any Mohammedan lady of high rank.

Behaim, Behem, or Boeheim, Martin (c. 1459-1506), a celebrated Ger. cosmographer, *b.* at Nuremberg. He studied under Regiomontanus (John Müller). In 1484 he is said to have accompanied the fleet of the Portuguese Diego Caõ on a journey of discovery along the Congo Coast, W. Africa. In 1486 he visited Fayal, in the Azores, returning to Nuremberg in 1490. He acquired fame for his practical methods of finding the lat. at sea by means of astronomical observation, for his finely executed maps, and for the globe which he bequeathed to his native city. He died at Lisbon.

Facsimile Atlas and *Behaim's Globe*, by E. G. Ravenstein, 1909.

Beham, Hans Sebald (1500–50), a Ger. painter and engraver. He was one of the best of Albert Durer's scholars, but his profligacy was, according to tradition, equal to his ability. As a painter he is scarcely known. His prints consist of woodcuts, and of etchings and engravings on copper. His cousin, Barthel or Bartholomaus B., was an excellent painter for his period. He was born about 1496 (or 1502) at Nuremberg, was a pupil of Albert Dürer, and died in 1540 at Rome. As one of the *petits maitres* of Dürer he engraved many beautiful works, and excelled as a painter of portraits, genre, and religious pictures. His picture in the Pinakothek at Munich of the resuscitation of a woman by touching her with the cross is one of the masterpieces of the old Ger. school. Barthel B. was also an engraver.

Behar, or Bihar: 1. An old div. of India, in the basin of the Ganges, now one of the four provs. of the Bengal presidency. It comprises Patna and Bhagalpur, which are subdivided into forty administrative districts. Area 44,170 sq. m.; pop. 24,241,305. 2. (Sanskrit *Vihar*, a monastery.) The chief tn. of the above prov., 35 m. S.E. of Patna. It was formerly a city of great renown, and has a great inn for Mohammedan pilgrims. There is trade in silk, muslin, and coloured prints and cottons. Pop. 44,984.

Beheading, or execution by decapitation, is an ancient form of capital punishment which was practised among the Greeks and Romans, and prevailed in England for several centuries. *See* DECAPITATION.

Behem, Martin, *see* BEHAIM.

Behemoth (*Heb.*, large beast) is a large herbivorous animal mentioned in Job xl. 15-24. It is supposed by many interpreters to mean the hippopotamus.

Behera, a prov. of Egypt, forming part of the delta of the Nile, W. of the Rosetta branch of the riv. The chief tn. of the dist. is Damanhur (pop. 31,000), where the railway from Cairo bifurcates for Alexandria and Rosetta. Pop. about 215,000.

Behistun, a rocky mt. side in the prov. of Ardelan, Persia, 22 m. E. of Kermanshah. It rises to a height of 1700 ft., and bears an inscription, at a height of 300 ft., in cuneiform writing in three languages, Persian, Susian or Elamitic, and Babylonian, besides some minor records in Arabic and Gk. The main inscription, first deciphered and trans. by Sir Henry Rawlinson (1835-45), relates the exploits of Darius the Great (*d.* 485 B.C.), and forms the key to Assyrian antiquities.

Behm, Ernst (1830–84), a German geographer and statistician, born at Gotha. He was the founder of *Geographisches Jahrbuch*, and ed. it from 1866-84; also editor of *Petermann's Mitteilungen*, 1878-84. From 1876 he was in charge of the statistical dept. of the *Almanach de Gotha*. With Hermann Wagner he compiled *Bevölkerung der Erde*, 7 vols., 1872-82.

Behmen, Jakob, *see* BOEHME, JAKOB.

Behn, Aphra (1640-89), Eng. novelist and dramatist, born at Wye, the daughter of John Johnson, and as a child went to Surinam, S. America, where she met the slave Oroonoko. She married a Dutch merchant, B., on returning to England, and later, was employed on a diplomatic service in Flanders by the king. When left a widow she supported herself by her pen. Her works suffer from coarseness but show considerable ability. Her best drama is *The Rovers* and her most famous novel *Oroonoko*. Her *Works* (6 vols.) appeared in 1871.

Behring, Vitus (*d.* 1741), a Dane by birth; entered the navy of Peter the Great, and made several attempts to settle the question as to the junction of Asia and America; discovered the island and strait that now bear his name.

Behring Island is situated in the S.W. of B. Sea. It is the most westerly is. of the Aleutian group. Desolate and uninhabited. Behring was wrecked here, and, without food or shelter, died miserably in 1741.

Behring Sea and Strait, the latter divides the continents of America and Asia, and also joins the N. Pacific with the Arctic Ocean. It is about 38 m. wide at its narrowest part, but is wider at the N. and S. extremities.

There are numerous bays on either side of the strait, which, however, are useless, as the waters are frozen over for several months in the year. The strait is named after the navigator Behring, who discovered it. B. Sea, which is sometimes called the Sea of Kamchatka, is a part of the N. Pacific Ocean, and is situated between B. Strait and the Aleutian Islands. It is the haunt of the whale, walrus, and fur seal.

Behring Sea Question, The, an international dispute, between the govs. of the United States, Great Britain, and Canada, connected with the unlicensed fishing of Canadian sealers in the Behring Sea. The seals round Pribylov Is. had been preserved under the supervision of the Russian gov.; after the cession of Alaska in 1867 the industry had been handed over to the N. American Commercial Co. In 1886 certain Canadian sealers started on a business basis the hunting and killing of seals beyond the three mile limit in the Behring Sea, in which Great Britain has commercial privileges, granted by Russia in 1825. The gov. of the United States took steps to prevent Canadian fishing, and their jurisdiction was objected to by the British minister, Sir Sackville West. In 1892, by the Blaine-Pauncefote Treaty, it was agreed that a Court of Arbitration should be held in Paris to settle the question at issue. This court decided: (1) That the United States gov. had no right of protection of property in seals beyond the three mile limit; (2) that the United States gov. had no exclusive rights of jurisdiction in the Behring Sea; (3) that a close season should be observed between May 1 and July 31; and (4) that vessels must be licensed, and the persons engaged in the business must be properly qualified. A bill, containing these and other clauses, was passed into law in America and in Great Britain. The United States also paid a sum of £92,700 to the Canadian gov. as a compensation for the ships she had unlawfully seized or damaged. Consult Stanton, *The Bering Sea Controversy*, 1892; *Report of the Bering Sea Commission*, 1893; and Henderson, *American Diplomatic Questions*, 1901.

Behut, also known as Jhelum, Jehlam, or Bitasta, and to the anct. Gks. as Hydaspes. One of the 'five rivers' of the Punjab. Rising in the mts. of Kashmir, it flows for 100 m. through the Kashmir Valley, passing in its course Srinagar, and entering the plains about 250 m. from its source, it runs past the tn. of Jhelum. Thence in a S. and later S.W. direction it flows on to join the Chenab R., 80 m. N.N.E. of Multan. The total course is about 450 m., and the river is navigable throughout nearly all of its length.

Beibars, Baybars, or Bibars, two Egyptian rulers: 1. Beibars I., (1620-77), sultan of the Mamelukes. He frequently fought against the Christians and the Mongols, and was cruel and bloodthirsty in war. He defeated the Crusaders under Louis IX. of France, captured Antioch in 1268, and ravaged the country round Mecca in 1269. He subdued the Armenians, and at one time almost extirpated the Syrian Assassins. The mosque at Cairo, which bears his name, was erected by him. 2. Beibars II. (1309-10) was a Circassian by birth. He was made ruler of Egypt by the Bahri Mamelukes, but was assassinated by a rival within a year.

Beijerland, or Bayerland, the name of three coms. of Holland known as Oud, Nieuw, and Ziud respectively, situated on the is. of Hoeksche Waard. Total pop. 9300.

Beilan, a small tn. in the N. of Syria, not far from Alexandretta, used as a summer resort by the European colonists of that tn. The B. Pass is 1800 ft. high, and lies between the mt. ranges of Amanus and Rhossus. It is supposed to be the anct. Pylæ Syriæ (Syrian gates) probably used by Alexander the Great and by the Crusaders. The tn. is the site of the battle fought in 1832 between the Turks and the Egyptians. Pop. about 5000.

Beilstein, Friedrich Konrad, Russian chemist, was *b.* at St. Petersburg in 1838. After studying at Heidelberg, Göttingen, Munich, and Paris, he became assistant in the Göttingen laboratory in 1860. Six years later he was made professor of chemistry at the St. Petersburg Technological Institute, from which position he retired in 1896. His publications are numerous, the chief being the *Handbuch der organischen Chemie* (Hamburg, 1880-83), and the *Anleitung zur qualitativen chemischen Analyse* (Leipzig, 1867).

Beira, a Portuguese prov. reaching from the Atlantic to the Spanish frontier. It is bounded by the R. Douro in the N. and by the Tagus and the Estremadura range in the S. It has an area of 9256 sq. m. It is mountainous but well watered, and there are many mineral springs. The productions are olives and wine. There are seven cities in the prov. and 238 other towns. Pop. 1,518,000

Beira: 1. A dist. in Portuguese E. Africa, situated round the lower course of the R. Pungwe. It is divided into the territories Manica and Sofala. 2. The chief tn. of the dist. B., a seaport at the mouth of the

R. Pungwe. It is the nearest port to Mashonaland, and the terminus of the Beira-Salisbury Railway, completed 1902. The exports are rubber, sugar, oil-seeds, bees'-wax, ground-nuts, mangrove bark, and ivory. Some gold is also found. Pop. 5000.

Beiram, *see* BAIRAM.

Beirut, Bairout, or Beyrout, a tn. and the prin. seaport of Syria, 55 m. W.N.W. of Damascus on a bay of the Mediterranean. The walls are 3 m. in circumference, and the suburbs beyond the walls are greater than the enclosed tn. Forming the seaport of Damascus, B. is a progressive and prosperous commercial centre. The harbour will only admit small ships, but the larger ones may anchor at a distance of half-a-mile from the shore, in bad weather shelter being found in the bay of the river of B., about 3 m. distant from the tn. It is clean, plentifully supplied with springs, and contains large bazaars, an American college, the palaces of a Greek and a Maronite bishop, and many missions and other institutions. There is a good service of European steamers. The prin. exports are silk goods and wool, oils, oranges, and other fruits, while most of the imports are from Great Britain. Silk is produced in large quantities, and there are important manufs. of silk goods and gold and silver thread. An excellent road and a railway connect with Damascus, crossing the Lebanon. The pop., which is continually on the increase, is estimated to exceed 120,000, about one-half being Europeans.

Beishehr Göl, a fresh-water lake in Karaman prov., Asia Minor, 35 m. long from N.W. to S.E., and 1 m. wide, draining into the Soghla Göl. The tn. of B. is on the E. shore of the lake.

Beit, an Arabic word which properly signifies a tent or hut, but is also used to denote any edifice or abode of men. It is often found as a component part of proper names, *e.g.* Beit-al-Haràm, *i.e.* 'the sacred edifice,' or 'the edifice of the sanctuary,' a designation frequently given to the temple of Mecca.

Beit, Alfred (1853-1906), S. African financier and philanthropist, born at Hamburg; he entered a firm of S. African merchants there, proceeding to Kimberley in 1875 as a representative for the firm in the diamond dist. In 1879, after returning to Hamburg for a year, he set up as an independent diamond merchant in Kimberley. In 1882 he became associated with Porges and Wernher, and during 1884-8 was S. African representative of their firm of J. Porges and Co., going into partnership in 1890. He was a close friend of Cecil Rhodes, and assisted him in the amalgamation of the Kimberley mines into the De Beers Consolidated Mines. After 1888 he was engaged in developing the Transvaal gold-mines, and in 1889 became a director of the British S. Africa Co. for the administration of Rhodesia. In 1905 he founded professorships at Oxford in colonial history, and left large sums to various charities at his death.

Beit-el-Fakih, a fortified tn. in the vilayet of Hodeida (formerly Yemen), Asiatic Turkey, near the Red Sea. An important trading centre for coffee. Pop. about 8000.

Beith, a market tn. in N. Ayrshire, Scotland, 10½ m. S.W of Paisley, on the Glasgow, Barrhead, and the Kilmarnock Joint Railway. Coal and fireclay are found in the neighbourhood. There are manufs. of linen, thread, rope-making, cabinet-making, and upholstery. Tanning and currying of leather is also carried on. Pop. 5000.

Beja, the cap. of the dist B., Portugal, about 90 m. from Lisbon. There are remains of Roman walls and a gateway. Its manufs. are leather and pottery, and it trades in olive oil. It has a noted cathedral and castle. Pop. 8925.

Beja, or Boja, an African people N. of Abyssinia, between the Nile and the Red Sea, widely spread in Nubia. They are probably Hamitic, and include the Ababda, Itadendoa, Bisharin, and other tribes. They are now Mohammedans. They represent the Blemmyes of Strabo.

Bejan, or Bajan (Med. Lat. *Bejanus*, Fr. *bec jaune*, yellow beak, *i.e.* fledgling), a name applied to freshmen in the universities of the middle ages, still surviving in St. Andrews and Aberdeen. Bejaunia, or payment for students entering the university, was part of an opening ceremony which led to much horse-play and rowdyism.

Bejapur, *see* BIJAPUR.

Béjar, a fort. tn. in the prov. of Salamanca, Spain, on the R. Cuerpo de Hombre, 3165 ft. above the sea-level. It is surrounded by old walls; within it the ducal family of the same name has its ancestral palace, and there are many interesting churches, notably Santa Maria, San Juan, and El Salvador. There are sulphur springs, 108° F., in the neighbourhood. B. has factories of wool flannels, serges, and cloth, and tanning is carried on. Pop. 9000.

Bek, Antony (*d.* 1310), bishop of Durham, 1283, by the nomination of Edward I. He was a lavish spender, and was renowned for his magnificent retinue. He was one of the royal commissioners to negotiate a marriage between the king's son, Edward,

and Margaret, the infant queen of Scotland, 1290. In 1291 he was chosen for his eloquence to address the Scottish estates. In 1294 he was sent on an embassy to arrange an alliance with Germany against France. In 1296 he took a prominent part in Edward I.'s expedition against Scotland, and received Baliol's submission in the castle of Brechin. After his return from the battle of Falkirk he appears to have lost Edward's favour, and from this time till his death was involved in numerous eccles. disputes. In 1302 B. set out to Rome to place an appeal against Prior Richard without asking the king's leave; in consequence the temporalities of his see were confiscated, but he afterwards regained them. Clement V. made him patriarch of Jerusalem in 1305, and two years later Edward II. granted him the sovereignty of the Isle of Man. He died at Eltham, and was buried in Durham Cathedral. The chief authority for his life is Robert de Graystanes, *De Statu Ecclesiæ Dunelmensis*, ed. by Raine, 1839. Consult also W. Hutchinson's *History of Durham*, 1823, and J. L. Low's *Diocesan History of Durham*, 1880.

Bek, Thomas (*d.* 1293), Bishop of St. Davids. In 1269 he became chancellor of Oxford University; keeper of the wardrobe to Edward I., 1274; keeper of the great seal during Edward's absence in France, 1279. Besides his secular offices, he held many lucrative eccles. preferments. He founded the collegiate church of Llangadoc and Llandewi-Brefi, and a hospital at Llawhaden. In 1290 he took a vow to take the cross, and set out for Palestine, but it is uncertain whether he actually left England.

Bekaa El, or **El Bika**, the ancient Cœle-Syria; in the O.T. Hamath, the 'plain of Lebanon;' a Syrian valley lying between the ranges of the Lebanon and Anti-Lebanon mts. It is watered by the Nahr-el-Litany (Leontes) and Nahr-el-Asi (Orontes). Its length is about 90 m., and the greatest breadth 20 m., and has an alt. of 2600-3000 ft. The Arabs use the valley for grazing-ground. The chief tn., Baalbek, is of great antiquity, and has many remains of archæological and historical interest.

Beke, Charles Tilstone (1800–74), an English explorer, born at Stepney. He devoted his early life to the study of ancient history and philology, and in 1834 pub. *Origines Biblicæ*, *Researches in Primeval History*. He joined Major Harris' expedition to Abyssinia, 1840, and explored Gojam and hitherto unknown countries to the S. He published the result of his researches in *Abyssinia: A Statement of Facts* (2nd ed., 1846), and *On the Sources of the Nile*, 1849, and in other essays. In 1861 he visited Harrar, and four years later he set out to Abyssinia to urge the release of certain British captives but was unsuccessful. He claimed to have discovered that Mt. Sinai lies E. of the Gulf of Akabah, but many authorities assert that it lies to the W., as generally supposed. The *Discoveries of Sinai in Arabia* appeared posthumously, 1878. Other works are: *King Theodore*, 1869; *Idol in Horeb*, 1871.

Békés, a tn. of Hungary, at the junction of the White and Black Körös, noted for its agriculture, and specially the cultivation of flax. It trades in cattle and honey. Pop. 25,620.

Bekker, Balthazar (1634-98), Dutch Protestant theologian, *b.* in Friesland; educated at Groningen and Francker; pastor at Franeker, and after 1679 at Amsterdam. He pub. sev. works on philosophy, in which he was a follower of Descartes, and theology, in which his freedom of thought caused considerable opposition. His *De Philosophia cartesiana admonitio sincera*, 1665, was written to demonstrate a relationship between Descartes' philosophy and theology. His most famous work, *Die Betooverde Wereld*, or *The World Bewitched*, 1691, expresses a disbelief in sorcery, magic, and possession by and even the existence of the devil. The book is an interesting example of the early critical study of comparative theology. On its publication B. was removed from the ministry and excommunicated.

Bekker, Elisabeth (1738–1804), a Dutch poetess and novelist, was the wife of Adrian Wolff. She resided in France for some time with Agatha Deken, and it was in conjunction with this friend that she wrote her novels, sentimental and extremely long-winded works in the style of Richardson. She also wrote some satirical sketches. Perhaps her most popular works were: *Historie van den Heer Willem Leevend*, 1785; *Historie van Mejuffrouw Sara Burgerhart*, 1782; *Abraham Blankaart*, 1787; *Cornelia Wildschut*, 1793-6. Her poems are uninteresting.

Bekker, Immanuel (1785-1871), a Ger. classical
born at Berlin
of philology,
texts of many of the classics from the actual manuscripts in the large libraries of Europe, and independent of other printed eds. His eds. include *Plato*, 1816-23; *Thucydides*, 1821-32; *Aristophanes*, 1829; *Aristotle*, 1831; and *Homer*, 1858. He ed. 25 vols. of the *Corpus Scriptorum*

Byzantinorum, and *Anecdota Græca*, 3 vols., 1814-21.

Bektashi, a name applied to a class of dervishes (*q.v.*), estab. in 1357 by Hadji Beygtash or Bektasch. When called upon by Amurath I. to bless his soldiers he gave them the name of Yeni-Shery, *i.e.*, new soldiers, which is the origin of the word Janissary.

Bel, or Belus, the chief deity of the Babylonians and Assyrians, known to the Hebrews as Baal, the name signifying 'Lord' in both languages. B. corresponds to the Greek Zeus and the Roman Jupiter.

Béla, the name of four kings of Hungary in the Arpad dynasty. Béla I., 1061-3, who succeeded his brother Andrew, did much to improve the commerce of Hungary by standardising weights, measures, and coinage, pacified the country, estab. Christianity securely, and introduced the representative system into the diet. Béla II., known as 'the Blind,' 1131-41, succeeded his second cousin, Stephen II., and was the son of the Pretender Almus. The kingdom was mainly administered by his wife, Helena of Siberia, at whose instigation the ministers of the preceding king were massacred at the diet of Arad. Béla III., 1173-96, was grandson of Béla II., and succeeded Stephen III. He had been educated at Constantinople, and introduced many Byzantine customs into Hungary. Béla IV., 1235-70, grandson of Béla III., deposed and succeeded his father, Andrew II. He was a supporter of the freemen against the nobles, whose power he attempted to break. In 1241 Hungary was overrun by Mongols, and, asking aid of Frederic of Austria, Béla was compelled to yield some of his territory to him. Later he vanquished both the Mongols and Frederic.

Belalcazar, tn. of Andulasia, Spain, 50 m. N.W. of Cordova. Manufs. woollens. Pop. 7500.

Bel and the Dragon, The Story of, an apocryphal addition to the Book of Daniel in the Bible, forming two distinct and separate stories. The original text is considered to be either Greek or Aramaic. The stories are variously received; by the Roman Catholic Church as true, forming the fourteenth chapter of Daniel in the Vulgate; but they are generally accepted as fables, written to impress the instability of idol worship.

Coming to us from different sources the writings vary greatly in detail, but the stories may be given in brief, as:

Bel.—Daniel declines to worship an image of Bel (Baal), and when the King of Babylon points out how great a quantity of food the image consumes each day, Daniel has all the entrances to the temple closed first sprinkling the floor with fine ashes. In the morning footprints show that the food has been removed by the priests through a secret door. Whereupon the king has the image destroyed and the priests put to death.

Dragon.—Daniel refuses to worship a dragon, which he kills by throwing a ball of pitch down its throat. Yielding to the angry people, the king has Daniel cast into a den of lions, where for six or seven days Daniel lived unharmed. On discovering this the king has Daniel's accusers thrown in and devoured, while Daniel is released.

Belasco, David (*b.* 1862), American dramatist, born in San Francisco, and appeared at the Metropolitan Theatre there in 1874. Later he was stage manager of the Madison Square Theatre in New York, but he is best known for his original plays. These include *Hearts of Oak*, 1880; *La Belle Russe*, 1882; *May Blossom*, 1884; *Valerie*, 1886; *The Wife*, in collaboration with H. C. de Mille, 1887; *Lord Chumley*, 1888; *The Charity Ball*, also with De Mille, 1889; *Men and Women*, 1890; *The Girl I left Behind Me*, together with Franklin Fyles, 1893; *The Heart of Maryland*, 1895; *Zaza*, 1898; *Naughty Anthony*, 1899; *Madame Butterfly*, of which the plot was taken from John Luther Long's novel, 1900; *Du Barry*, 1901; *The Darling of the Gods*, 1902; *Adrea*, 1904; *The Girl of the Golden West*, 1905. He is now owner and manager of the Republic and Belasco Theatres, New York.

Belbeis, a small tn. of Lower Egypt, situated on the eastern arm of the R. Nile, about 30 m. from Cairo; pop. 11,500.

Belcher, Sir Edward (1799–1877), an admiral of the British navy, which he entered in 1812. He was present at the bombardment of Algiers in 1816, and accompanied Captain Frederick William Beechey, as a surveyor, in the 1825 expedition to explore the Bering Strait. Promoted to commander in 1829, and in 1836 appointed to command the *Sulphur*, he took part in the war in China, 1840-41. In 1843 Belcher was knighted, and in 1852 was given command of the unsuccessful gov. expedition to search for Sir John Franklin. He became K.C.B. in 1867 and admiral in 1872. Pub. *Last of the Arctic Voyages*, 1855, and a number of other works.

Belchite, a tn. 20 m. S. of Saragossa in Spain. Here the Spanish General Blake was defeated on June 18, 1809, by the Fr. under Suchet. Pop. 3300.

Beled, or Balad, an Arabic word, signifying a tn., prov., or country, occurring in many eastern geographical names, *e.g.* Biledulgerid = Balad-

al-Jarid, or the 'country of palm trees.'

Beledug[illegible] of Fr. W. [illegible] R. Niger, [illegible]

Belem (s[illegible] a town in [illegible] entrance to the R. Tagus. It is noted for its castle. Pop. 8500.

Belem, or Para, situate by the bank of the Tocantins or Para R. The cap. of the prov. of Para in Brazil, containing many splendid buildings, including a cathedral, bishop's palace, and gov. house, while there is a good harbour. The dist. is fertile and the pop. of the city about 100,000.

Belemnitella, a genus of dibranchiate mollusc occurring in the Upper Cretaceous, and belonging to the family Belemnitidæ. The species, *e.g. B. mucronatus* and *B. granulatus*, are marked on the anterior and ventral face by a long narrow fissure.

Belemnites are a genus of fossil dibranchiate molluscs representing the family Belemnitidæ which is closely allied to the Sepiidæ, or cuttle-fish family. These fossils, which occur abundantly from the Lias to the Cretaceous, are merely the internal shell of the animal's body; they are multilocular a[illegible] conical portion [illegible] fitting into a [illegible] From a few well-preserved specimens it has been seen that they had ten arms provided with hooks, and in some cases an ink-bag has been discovered. The size of the B. seems to have varied from a few inches to several feet, and the part most often found is the rostrum.

Belfast, a city of Ireland, and a co. and parliamentary borough, is the cap. of Ulster prov. and the co. tn. of Antrim co. It is 112 m. N. of Dublin by rail, and is an important railway centre, the Great North, the No[illegible] Central, and Belfast and Cou[illegible] Down railways running through city. Situated at the entrance of the R. Lagan into Belfast Lough, B. is a seaport of the first rank; passenger communication is maintained with Liverpool, Heysham, Glasgow, etc. Until recently B. was subject to epidemics, being built on alluvial deposit, and it is only by careful drainage that it has been made more salubrious. Many fine buildings are to be seen in the city, including the Public Library, the new City Hall, built in 1906, and the Post Office. The old Queen's College was replaced by Queen's University under Irish Universities Act of 1908; there are also Presbyterian and Methodist colleges, a Royal Academical Institute, and a Municipal Technical Institute. There are sev. fine public parks. The older churches of the city are classical in design, the modern, Gothic. The three main religious bodies are the Protestant Episcopalians, the Roman Catholics, and the Presbyterians. The surrounding country is well wooded and picturesque, many country seats and villas lying in the neighbourhood. B. Lough is very pretty, and round its shores have sprung up many residences of the wealthier persons in the city, forming the vils. of Whitehouse, White Abbey, Holywood, and Bangor. Early remains are found in the chalk beds at *Cave Hill*, the scene of a battle between the Irish and savages of the Ards, 1408. The harbour of B. is under the management of a Board of Harbour Commissioners, elected by the ratepayers and shipowners. The shipbuilding trade has grown to immense proportions, the firm of Harland and Wolff being the largest. The Alexandra Dock, which was opened in 1889, is now, with all its modern improvements, one of the most commodious harbours in the United Kingdom. B. is also an important distributing port; it is the centre of the Irish linen industry, and the business headquarters of the flax spinning and weaving industry. It has many distilleries, and large tobacco and rope works. The chief exports are linen, whisky, iron ore, aerated waters, and cattle. It was created a city in 1888, and in 1897 the title of 'Lord Mayor' was conferred upon the mayor of the city. It sends four members to parliament. The origin of the tn. and of its name are alike lost in obscurity. A castle is said to have been built by John de Courcy in 1177, and destroyed in 1316 by Edward Bruce. At the beginning of the 16th century B. was no more than a vil., owned by the O'Neill family, who were in opposition to the reigning [illegible] 1552 Hugh O'Neill to his king, and re[illegible] nd fortress of B. and the surrounding lands, but lost them in 1571 to Sir Thomas Smith, after whom Sir Arthur Chichester had them. B. received a charter in 1613, and under Wentworth's wise policy started on a career of prosperity and progress. The cotton manuf. was begun in 1777, and the shipbuilding trade in 1791. There have been various riots in the city owing to the intensity of the religious opposition of the different sects, notably in 1880, 1884, and 1907. The pop. in 1901 was 349,180.

Belfast, a city and seaport of Maine, U.S.A., on the W. side of Penobscot Bay, Waldo co. Industries, shipbuilding and manufacturing. Pop. about 5000.

Belfast Lough, an inlet on the E. coast of Ireland, situated between the

tns. of Antrim and Down. It is an estuary of the Lagan, and is 7 m. wide at its mouth. It extends 15 m. inland, and has the tns. of Belfast, Carrickfergus, Holywood, and Bangor on its shores.

Belfort, cap. of the ter. of the same name, the fragment of the dept. of Haut-Rhin left to France at the cession of Alsace to Germany in 1871. It stands on the R. Savoureuse, in the depression called the Trouée de B., between the Vosges and the Jura, 117 m. N.E. of Dijon. It was ceded to France by Austria at the Peace of Westphalia in 1648, and fortified by Vaubon. In the Franco-German War of 1870-1 it withstood a siege of three months, capitulating with military honours on Feb. 16, 1871, and was restored to France at the Peace of Frankfort. The fortifications have since been enormously strengthened. Pop. 91,763.

Belfry (Old Fr. *berfrei* and low Lat. *belfredus*, a term of Teutonic origin compounded of the words for 'bell' and 'peace'). It was originally a tower used for purposes of defence, later a watch tower, or one from which an alarm bell was rung, and finally a bell-tower, usually confined to eccles. buildings. It generally forms part of the church, but is sometimes a separate building, as with the Italian campaniles. Such belfries are found in England at Evesham, Berkeley, Beccles, and sev. places in Cornwall and Scotland, where the church stands in a glen, the B. then being placed on the hillside above it. Municipal belfries, attached to the Town Hall, are common on the Continent, as at St. Quentin, Douai, Brussels, etc., and are also found at Glasgow and Aberdeen. The famous B. at Bruges, with a carillon of forty-eight bells, is part of 'Les Halles.' The framework of a B. is made to rest either upon stone corbels or upon recesses in the wall, in order to mitigate the effect of the vibration upon the masonry. The higher the bells are hung the more this is felt.

Belgæ, the general name given by Cæsar to the different tribes who inhabited the N. of Gaul, between the sea on the W., the rivs. Matrona (Marne) and Sequana (Seine) on the S., and the Rhenus (Rhine) on the E. But it is not well determined how far this name may be extended to the E.; perhaps the Treviri, on the banks of the Moselle, were included. Cæsar also (*Bell. Gall.* v. 24) uses the term Belgium to express the country of the B. The B. were, according to Cæsar, of Ger. origin. The Bellovaci (Beauvais) were the most warlike and numerous Belgic tribe in the time of Cæsar (*Bell. Gall.* ii. 4). The rest of the tribes are mentioned by Cæsar (ii. 4); among them we find one name, the Atrebates, the same as that of a Belgic tribe in Britain. The B. may be described generally as occupying, in the time of Cæsar, the Fr. depts. of Nord, Pas de Calais, Somme, Seine Inférieure, Oise, and Aisne, with a part of modern Belgium.

When Cæsar invaded S. Britain he found that part of the is. occupied by B., that is, by tribes of German origin (*Bell. Gall.* v. 12). The whole southern coast from Suffolk to Devonshire was probably occupied by Belgic tribes.

Belgard, a tn. of Prussia, in the prov. of Pomerania, situate 16 m. S.W. of Köslin, on the Persante. There is an old castle and large horse and cattle markets are held. Pop. about 8000.

Belgaum, or Belgam, a dist. of Bombay in British India. The tn. and cap. of the same name is situate 2500 ft. above sea level, and contains an old fort. The dist. is generally productive and cotton-cloth is manufactured.

Belgiojoso, a tn. of Northern Italy, 8 m. E. of Pavia. Pop. 4000.

Belgiojoso, Christina, Princess of (1808-71), an Italian patriot and authoress. Born at Milan, she was the daughter of the Marquis Trivalzio, marrying the Prince of Belgiojoso. In 1830 she moved to Paris, where she warmly took up the cause of Italian liberty. In 1848 she supported the Italian revolution, and at her own expense raised a troop of volunteer patriots. On the defeat of her party in the following year her property was confiscated and, an exile, she returned to Paris, where she continued her literary work. She died at Milan. She founded and edited sev. periodicals, in addition to contributing to others, and wrote several works.

Belgium, one of the smallest European countries, ranking sixteenth in point of area and eighth in accordance with population. It formed part of the older kingdom of the Netherlands until, by the Congress of Vienna, it was constituted as a separate kingdom. It was anciently a part of Gallia Belgica, so called from the tribe 'the Belgæ' who were originally found there. It is bounded on the N. by the Netherlands, on the S. and S.W. by France, on the E. by Luxembourg and Rhenish Prussia, and the N.W. by the North Sea. It lies between lat. 49° 30′ and 51° 30′ W. and long. 2° 33′ and 6° 7′ E. It has an area of about 11,373 sq. m.. about one-eighth of the area of Great Britain. Its greatest length is a line drawn from Ostend to Arlon, about 174 m. It is divided into nine provs., Antwerp,

Brabant, E. Flanders, W. Flanders, Hainault, Liege, Limbourg, Luxembourg, and Namur. Its cap. is Brussels. In general, B. is a very flat country, having few elevations, and the greatest height to which any of these elevations rise is not more than 2000 ft. In the S. and E. it takes more the general aspect physically of Northern France, while in the N. and N.W. it resembles Holland. A continuation of the Ardenne uplands separates the river valley of the Meuse and the Moselle, and extends in a north-easterly direction into Prussia. The provs. of Liege, Luxembourg, and Namur are divided up by numerous ravines and streams, by deep valleys and ridges of hills. The vegetation is poor and the country in this part is covered with dense forests, which become less extensive as approach is made to the coast. The northern and western provinces are, however, the boast of the people, both because of their pleasant aspect and their great fertility. These provinces consist of well watered and extensive plains, which are easily cultivated. The provs. bordering the sea partake of the same nature as the land of Holland. In many places the inundations of the sea are only kept back by the dikes which have been built and which are called locally 'bolders.' Nearly 200 sq. m. of land are thus artificially protected from the inroads of either the sea or rivers. The coast is gradually undergoing change, and northward from Nieuport the sea is gradually encroaching upon the land, while southward of that tn., towards the Pas de Calais, the sea is gradually receding. Much of the sandy and marshy land which was held to be of little use has been gradually reclaimed, until at the present day whole colonies of people are living on and cultivating land which not very long ago was held to be almost useless and irreclaimable.

B. is noted for the abundance of its good waterways. These waterways fall into two great divs., the navigable rivers such as the Scheldt and the Meuse and the magnificent system of canals. The two great rivs. of B., the Scheldt and the Meuse, enter that country from France where they have their source and enter the sea in B. They are navigable throughout the whole of their course in B., and are supplemented by a number of tributaries which enter them during their course through B., and some of which are themselves navigable. The course of the Scheldt through B. is about 110 m., its prin. tributaries being the Ruppel, the Dender, the Durme, and the Lys. The Meuse has about 115 m. of navigable water in B. and receives in its course the waters of the Sambre and the Ourthe. Another riv. of B. is the Yzer, which enters the sea at Nieuport and which is navigable for about 26 m. In addition to these magnificent systems of natural waterways, the country is also supplied with a magnificent canal system. These canals number forty-four, and have an entire length of over 500 m. The chief canals are from Bruges to Ostend, from Brussels to Charleroi, from Brussels to Willebroeck, and from Ghent to Bruges. The largest canal is 16 m. in length, and runs from Brussels to Charleroi. The climate of B. is very similar to that of England; it is, however, a little colder in winter and hotter in summer. The S.E. part is much to be preferred to the damp and hazy atmosphere of the N. and N.W. Frost is usually not encountered until the middle of October nor after the middle of April. The mean annual temp. is about 50° F., while the mean annual rainfall is about 28 in. or about 3 in. less than that of London. The rainfall, however, varies from an average of 27 in. in the W. to a little over 40 in. in the E. of the country. The agriculture of the country is well looked after by a special committee which is appointed for that purpose. A central committee supervises the whole, while in the provs. there are smaller committees who superintend and report annually on the condition of agriculture in the various provs. During every five years a great exhibition of horses, cattle, agric. implements, and produce is held at Brussels at which many prizes are given, and in this way the best interests of agriculture are looked after. Many local exhibitions are held annually in the country. About 7,000,000 acres of land are under cultivation in B., most of this land being in the hands of small holders who cultivate about two to three acres of land. A great number of women are employed in agric. work, the ratio of men to women being as ten is to six. The agric. implements used are very primitive, practically all the work on the small holdings is done with the spade, while apart from agric. work a great deal of the land is devoted to gardening. The chief cereal crop cultivated is rye, wheat and oats being also fairly extensively grown. Chicory, flax, leguminous plants, hemp, madder, and beet are also common crops. Tobacco is not now grown as extensively as heretofore, but is confined practically to the provs. of Flanders and Hainault. A crop which is increasing every year is that of beet, which is grown more and more for the purpose of extracting the sugar. The breeding of horses is also a great industry, and for the

purpose of improving the breeds, a government stud of horses has been established at Teroneren. On the coasts there are very valuable fisheries, but this industry was much hurt by the admission of foreign fish into the B. markets duty free. The mineral wealth of B. is also of great importance. The prin. minerals are lead, copper, zinc, marble, granite, slate, iron, and coal. The coal is found principally in two basins, the eastern and the western. The eastern basin is about 100,000 acres in extent, while the western basin is more than double that size. The chief centres of the western basin are Hainault and Namur, while the eastern basin has its centre in Liege. B. next to Great Britain has the greatest amount of coal of all the European nations. In conjunction with the coal deposits it has also rich deposits of iron. The coal found in B. varies from anthracite to the richest of gas coal; the mines are under the general supervision of the minister for the interior, who administers them with the help of a corps of engineers who are appointed by him to the various mining dists. There are upwards of 200 mines in B., more than 50 per cent. of which are in full working order, and provide employment for over 100,000 people. The value of the annual output of coal is £16,500,000. The manuf. of iron is also of immense importance, there being 500 iron-works in the country, and the annual value of iron output is estimated at over £7,000,000 per annum. The product of marble, freestone, granite, and slate is also of great importance to the country; the black marbles which are produced in some parts of the country being of great value. There are in addition numerous lead, zinc, copper, and steel works throughout the country which find employment for many of the inhabs., and most of which are increasing in value every year. Glass is also fairly extensively manufactured.

The chief manufs. of B. are linen, woollens, cotton, silk, lace, and leather. Flax is one of the most important products, and the linen manufactories have their centre in Flanders, where they employ about 350,000 people. The lace industry is not so important as it once was, but still gives employment to a large number of people. The woollen industry has its centre round Ghent and Ypres, and employ a great number of people. The chief centre of the cotton trade is the tn. of Ghent, while the manuf. of metal is chiefly centred in the tns. of Liege, Ghent, Charleroi, and Mons. The prin. imports of B. were returned in the year 1910 as wool £16,774,400, wheat £16,622,880, minerals £7,730,060, silver £7,258,800, rubber over £600,000, hides over £5,500,000, flax over £4,000,000, coal over £4,000,000, diamonds nearly £400,000, cotton £3,399,800. The prin. exports were returned, in millions of pounds, as, approximately, wool 14·5, rubber 5·1, wheat 5, flax 4·8, rail and tramcars 4·5, diamonds 3·9, zinc 3·6, hides 3·6, coal 3·1, iron and steel bars 2·9, iron and steel 2·7. The commercial intercourse of B. and Great Britain is indicated by the amount of exports to and imports from in 1910, which were then returned as, imports from, £19,195,174, an increase of over £1,000,000 on the previous year, and exports to £17,838,334, an increase of nearly £1,500,000 on the previous year.

The pop. of B. was given in the same report as 7,382,572, the returns of the census of Jan. 1, 1911, not being known. The pop. of the two largest towns was, Brussels, 720,181, and Antwerp, 402,328. The religion of the country generally is Roman Catholic, [illegible] of conscience is [illegible] and all ministers, no matter of what denomination, are paid by the state. The kingdom is divided into six Roman Catholic dioceses; there are also a great number of conventual houses. The number of Protestants is approximately 15,000, and the number of Jews 3000.

Language.—The languages spoken in B. are Fr. or Walloon, a dialect of ant. France, and Flemish or Dutch. Fr. is the language of the educated and upper classes, but is generally understood throughout the kingdom. The Fr. dialect prevails in the S. and E., the Flemish or Dutch in the provs. of Antwerp, Brabant, Flanders, and Lembourg.

Gov. and constitution.—The gov. is based upon the strictest liberal principles; all power emanates from the people. Justice is free to all, the press is free, the people are surrounded on every side by safeguards designed to ensure to them the proper gov. of their country and their own personal liberty and freedom of conscience. The gov. is a constitutional and hereditary monarchy. The legislative power is vested with the king, the chamber of representatives, and the senate. Judicial power is exercised freely without dependence upon any authoritative influence and provincial affairs are governed by provincial councils. The royal succession is in the direct male line in order of primogeniture. The king can do no wrong, his person is sacred, and the ministers are responsible for all his acts. He cannot suspend or dispense

with the laws. He has power to nominate to all civil and military offices, and he commands both army and navy. He can declare war, make peace, and conclude offensive and defensive alliances and commercial treaties which he must communicate to the chambers. He has power in default of male heirs of nominating his successor with the consent of the chambers. He can only appoint one regent, and under a regency the constitution cannot be altered. The legislature meets annually in November, and must sit for forty days. The king has the power of dissolving them, and on dissolution a fresh election must take place within forty days. The chamber of representatives is chosen by the people, and consists of one member for every 40,000 inhab. The members receive a monthly payment of £16 13*s.* 4*d.*, and are elected for four years, half of them retiring at the end of two years except in the case of a dissolution, when they all retire. This chamber has also the right of nominating the members of the senate. In order to be elegible for the senate it is necessary to be a Belgian, or to have received the grand nationalisation, and to pay at least £84 in direct taxation. Lists of eligible members are drawn up by provincial councils, and the lists are submitted to the chamber of representatives. This chamber consists of half as many members as the chamber of representatives. They are elected for eight years, half retiring at the end of each four years. They receive no payment for their services. The senate is elected by the general electors. To be a general elector it is necessary to be a Belgian by birth, or to have received the grand nationalisation, and to pay 33*s.* 4*d.* in direct taxes. The king has the right of appointing his own ministers. They have right of admission to the chambers, but no right to take part in deliberations unless they are members. They can be dismissed at pleasure and can be accused by the house of representatives before the court of cassation. For civil purposes the provs. are divided into 26 arrons., 204 cantons, and 2528 coms. They are divided for military purposes into 41 arrons., 303 cantons, and 2578 communes.

Education.—The gov. have shown their desire that education in B. should attain a high standard. The educational institutions are divided into four sections—primary, middle, superior, and special. In addition normal schools have been built for the special training of efficient teachers. The primary and middle schools are chiefly under the control of the gov., and are open to frequent inspection. The superior institutions are the four great universities of Ghent, Liége, Brussels, and Louvain. The special schools are chiefly engineering and mining schools, normal schools, military schools, and navigating schools.

B. history.—The history of B. as a kingdom can only be said to date from the time of the Congress of Vienna, but its history as part of the Netherlands goes back to the time of the Romans. In the Rom. period it formed part of Gaul, and was distinguished by the name of Gallica Belgica. It we
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many traces o
origin. By the
into this part o
tribes were greatly increased, and it is the history of the Franks in Europe that really forms the early history of the Netherlands. Later the country was divided into a number of independent duchies, bishoprics, and lordships, but the chief noble in the Netherlands for a very considerable time was the Count of Flanders. Towards the end of the 14th century the line of Flemish counts became extinct, and their ter. passed into the hands of the dukes of Burgundy. Then followed a period of Burgundian oppression, during which all liberty was suppressed, but during which also the wealth, prosperity, and industry of the country still continued to flourish in spite of the suppression of its free institutions. In 1477 the daughter of Charles the Bold, Mary, married the Archduke Maximilian, who in 1493 became the emperor of the Holy Roman Empire. In this way began the connection of the Netherlands with the house of Austria. The Netherlands was passed on by the emperor to his son Philip, who married the daughter of Ferdinand and Isabella of Spain, and was the father of the Emperor Charles V. Dying considerably before his father, Philip left the Netherlands to his son, by whom it was incorporated with the Spanish crown, and who began the connection of the Netherlands with Spain which lasted up to the Treaty of Utrecht, 1711. With the beginning of the rule of Charles V. we get
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progress of the Reformation. The northern provs. broke away, but B

remained under Spanish rule. For a short time after 1598 an independent gov. was set up there, but it failed owing to the death of the Archduke Albert, and the country reverted to the crown of Spain. In the century which followed, dist. after dist. was ceded to France during the wars with Spain and following the War of Devolution. By the Treaty of Ryswick (1697) a great amount that had been lost at Nimeguen (1679) was restored. By the Treaty of Utrecht which concluded the War of the Spanish Succession, B. was ceded to Austria, and renewed her connection with that house, a connection which had begun in the 15th century; in future she was known as the Austrian Netherlands. During the century which followed, the fortunes of the Austrian Netherlands underwent many vicissitudes. In the War of the Austrian Succession B. was overrun by France, but all conquests were restored by the Treaty of Aix-la-Chapelle of 1748. The Seven Years' War left B. practically unmolested, and under Maria Theresa it experienced halcyon days. But Joseph II., the enlightened despot, roused anger by his reforms and danger by his proposal to open the R. Scheldt, and before his death B. had declared itself an independent nation—'United B.' Leopold II. promised an amnesty in return for surrender, but the Belgians held out and were subdued by an overwhelming Austrian army. Then came the days of the Revolution and Napoleon. The battles of Jemappes and Fleurus placed B. in the hands of the Fr., the treaties of Campio Formio (1797) and Luneville (1801) confirmed that possession, and for the rest of the Napoleonic period B. became to all intents and purposes an integral part of France, ruled by the Code Napoleon. After the abdication, 1814, B. again passed to Austria, and was administered by an Austrian governor-general, but in 1815 it was united to Holland, and William Frederick of Nassau became king of the Netherlands, taking the oath in Sept. 1815. It was an unfortunate alliance, the Dutch and the Belgians differed in nearly every respect; in religion, in manners, in language, in customs. The Belgians were almost immediately relegated to a very back seat in the gov., and a great feeling of discontent spread throughout the whole country. Nevertheless the prosperity of the country, its industries and its commerce increased, but even this did not satisfy the Belgians. The Revolution of Paris of 1830 was successful: the revolutionary spirit seized the Belgians, and the cry 'Imitons les Parisiens' roused them to zealous and successful imitation of the citizens of the capital of France.

The Belgians again declared in favour of independence, they were successful in keeping at bay the forces of the Dutch sent against them, and a suspension of hostilities took place while a congress of the five great powers was held in London. Here it was agreed that the country of B. should be independent, that it should be a constitutional monarchy, *not* a republic, that the Orange Nassau family should be permanently excluded. A candidate was chosen who declined to accept office: a regent was appointed, but failed to allay the unrest. The election of Leopold of Saxe-Coburg was the signal for a fresh Dutch invasion, which, however, retired before the superior strength of a Fr. army. The subsequent attempts to bring about a settlement did not come to an end until 1833, when a convention was signed by all parties.

[illegible] B. seemed *casus belli* Lembourg and Luxembourg, which by the convention had been given to Holland, as if they were in reality a part of its ter. The crisis was terminated by the action of the great powers, who reduced B.'s share of the national debt [illegible] and partitioned in dispute. The ountry was again volutionary spirit of 1848, but after 1850 the constitutional party began that series of reforms which have gained for B. the position of one of the freest countries in Europe. The question of Luxembourg threatened in 1861 the peace of Europe, and B. took part in the congress which prevented war breaking out. In 1870, on the outbreak of hostilities between France and Germany, B., fearing invasion, mobilised her troops, but her neutrality was recognised and left inviolate by both parties In 1885 the Congo Free State was acknowledged to be under the presidency of the King of B., Leopold II., who had succeeded his father in 1865. The management of the state has given cause for much bitterness, and has led to a number of scandals. Leopold II. died in 1910, and was succeeded by his nephew, King Albert. Pop. about 8,000,000.

Belgorod, or Bjelgorod (white town), a tn. of Kursk gov., Russia, on R. Donetz, 73 m. S. of Kursk. It takes its name from a neighbouring chalk hill. The old town is surrounded by a rampart and ditch, and the new town by palisades. B. is an episcopal seat, and has two monasteries and thirteen churches. There

are manufs. of leather, soap, woollens, wax, bristles, and hemp, and the surrounding country produces much fruit. Three large fairs are held here annually. Pop. 26,100.

Belgrade, cap. city of Servia, at the confluence of the R. Save with the Danube. Both rivs. are here broad and navigable, and fortifications extend from them to the brow of a ridge about 150 ft. high. The city is rapidly becoming western in appearance; the Turkish quarters have vanished, and only one Mohammedan mosque is left. The new part of the city is handsome and well built, with broad streets, beautiful gardens, a modern water-supply, and electric tramway, and numerous churches and public buildings. Most of the merchants carry on their trade in wooden stalls in the streets. The citadel stands on a promontory 100 ft. high, jutting into the Danube. The climate is very variable, with great extremes of temperature. The manufs. of B. are still trifling, but include arms, cutlery, saddlery, silks, carpets, cottons, and leather, but the city has a large trade as the commercial exchange between Turkey and Austria. The chief exports are wool, skins, and hides, wax, honey, tan-bark, silk, cattle, pigs, and timber; while hardware, salt, pottery, and agric. produce is imported. The surrounding country is very beautiful, but the city itself is dirty in the extreme. It has had an eventful history, being besieged in 1456 by the Turks, who were defeated by John Hunyady: taken by them in 1522, and by the imperialists in 1688. It was recaptured by the Turks in 1690, and in 1717 surrendered to Prince Eugene. The Turks regained it in 1739, but lost it to Austria in 1789. It was restored to Turkey in 1791, and the Turkish garrison withdrew in 1867. Pop. 80,000.

Belgravia, a fashionable and residential district in the West End of London, lying to the S. of [illegible] Square, and adjoining Hyde [illegible]

Bĕlial (correctly Belial), [illegible] pound Hebrew word, meaning 'that which is without profit or worth.' It is often treated by the translators of the Bible as if it were a proper name, and has certainly acquired a kind of personification by usage in such phrases as 'a son of B.,' and in the passage, 'What concord hath Christ with Belial?'

Beliapatam, a tn. in Malabar dist. of Madras presidency, British India, standing on the riv. of the same name, 4 m. from Cannanore.

Belidor, Bernard Forest de (1697 or 8-1761), the son of a Fr. officer; left an orphan, he was adopted by another Fr. officer, who brought him to France. He became an eminent military engineer, and wrote many works on military [illegible]

Belief. [illegible] to denote [illegible] gestion, or fact in very much the same sense as the words faith and trust. Psychologists give various definitions of the term, and it would appear that while the acceptance of a certain association of ideas or reputed circumstances is required, it is not necessary that they be true. The basis of B. has been given as the probability of a chain of ideas: the error, when the B. is proved erroneous, being the assumption of a false statement in the evidence of truth. B., however, must not be confounded with the word knowledge, as predisposition and suggestion have undoubtedly a strong bearing on the judgment of a connection of ideas; while lack of intellectual ability or use or the interposition of another B. as a truth, are means by which a true logical conclusion may be missed. In the Christian religion faith and B. are particularly used as acceptance of and full reliance in the teachings of the Bible, and more especially Christ. Books of reference: Bain, *The Emotions and the Will*; Hume, *Inquiry*; James, *Psychology*; Mill, *Analysis of the Phenomena of the Human Mind*; Spencer, *Psychology*; and Locke, *Essay*

Beligrad, the Turkish and Slavonic name for Berat (*q.v.*).

Belinsky, Visarion Grigorievitch (1811-48), a Russian man of letters, born at Chembar, gov. Penza; educated at the Moscow University. B. was one of the greatest of Russian critics, and has been called the 'Aristarchus of Russian literature.' *The Survey of Russian Literature since the Eighteenth Century* appeared in 1834. A complete ed. of his works was pub. in 12 vols. in 1859-62.

Belisarius, a famous Byzantine [illegible] n of the Emperor [illegible] born at Germania, [illegible] 505. He is first mentioned about 525, during the war between the Byzantine empire and Persia, when, as one of Justinian's bodyguard, he held a command in an expedition into Persian Armenia. It was soon after this that Procopius, from whose histories the events of the life of B. are gathered, became his secretary. In 530 B. became commander of the eastern imperial army, and defeated a large Persian force at Dara, in Northern Mesopotamia. In the next year the Persians invaded Syria, and B. was forced by the impatience of his troops to give battle, against his own judgment, at

Callinicum on the Euphrates. He was defeated and recalled to Constantinople, where he married Antonia, a wealthy but profligate woman. Here he supported Justinian against the conspiracy of the 'Green' party, who were attempting to make Hypatius emperor. In 533 he was sent into Africa to recover the imperial provs. held there by Gelimer, King of the Vandals. He landed in September at Caput Vada, and advanced to Decimum, where he gained a victory. He then entered Carthage, from which Gelimer fled towards Numidia, and again defeated the enemy. The king was finally captured at Mt. Pappua, and after sending contingents to reduce Sardinia, Corsica, and the Balearic Isles, B. returned to Constantinople, where he was honoured with a triumph, and a medal was struck to commemorate his victories. In 535 he was made sole consul. Later n that year he set out to recover Italy from the Goths. Landing at Catania in Sicily, he soon conquered the is., and crossed to the mainland. In 536 he took Naples and occupied Lower Italy, and at the end of the year entered Rome by amicable arrangement[illegible]. During 537 he [illegible] Vitiges, the [illegible] being abando[illegible], Vitiges retired to Ravenna. Narses was now sent from Constantinople with a reinforcement, but owing to a misunderstanding between B. and himself, resulting in the devastation of Milan by Braias, nephew of Vitiges, Narses was recalled, and B., now commanding both armies, refused to carry out a treaty sent from headquarters, leaving Vitiges with the title of king and the provs. N. of the Po. In 1540 he captured Ravenna, and took Vitiges prisoner, but was recalled by Justinian before completing his conquests. During 541-2 he was engaged in a campaign against the Persians, who had captured Antioch, but was recalled, degraded, and fined, on account of misrepresentations of his conduct. In 544 the Ostrogoths, under Totila, again invaded Italy, and B. commanded the expedition against them. In spite of an insufficient force, he kept the barbarians at bay and regained possession of Rome, but no reinforcements being sent him, he resigned his position, which was filled by Narses, and returned to Constantinople, where he stayed in retirement till 559. In that year he defeated the Bulgarians, who were threatening Constantinople. In 563 he was imprisoned on a charge of conspiracy against Justinian, but his innocence was soon estab., and he was released after six months. He died in 565, leaving one daughter, Joannina. His character for bravery, generosity, justice, and fidelity, and his talents for war, are only stained by his subserviency to his wife.

Belize, *see* BALIZE.

Beljame, Alexander (1842-1906), a Fr. writer, born at Villiers-le-Bel, Seine-et-Oise, died at Domont. He was a great student of Eng. literature, and lectured on the subject at the Sorbonne; he became Clark lecturer on Eng. literature at Trinity College, Cambridge, 1905-6. His chief work is *Le Public et les hommes de lettres en Angleterre au XVIIIe siècle*, 1881.

Belknap, Sir Robert, was chief justice of the Court of Common Pleas in the 48th year of Edward III.'s reign (1374). He continued to hold this office until the 11th year of the reign of Richard II. (1388), when he was removed for having, though with a remarkable protest, signed an affirmative to the question of Edward III., 'Whether he might by his regal power revoke that was acted in parliament.' In the succeeding parliament all the judges were arrested in Westminster Hall on a charge of high treason. The lord chief justice of the Court of King's Bench was executed, and the other judges, with B., barely escaped with their lives, through the intercession of the queen. (Fuller's *Worthies of England*.)

Bell, a hollow, metallic instrument, in shape resembling a reversed cup, suspended by its apex or neck, and having in its interior a swinging clapper, hammer, or loose ball.

Bell founding.—Bs. are made of a kind of bronze, known as B.-metal (*q.v.*) which is a mixture of copper and tin. In early times, Bs. were not cast, but were made of thin plates of hammered iron, riveted together. The B. called *Clog-an-eadhachta Phatraic* ('the bell of Patrick's will') at Belfast, mentioned in the *Annals of Ulster* as early as A.D. 552, is quadrangular in shape and of this primitive type, as are also some of the Scottish Bs. (Consult *Illustrated Catalogue of the Archæological Museum, Edinburgh*, 1856, and Dr. Joseph Anderson, *Scotland in Early Christian Times*, 1881.) The small Bs. discovered by Layard in the palace of Nimrod, on the site of the anct. city of Nineveh, are made of copper and tin, in the proportion of 10–1. During the middle ages the quantity of copper used was much reduced, and in Henry III.'s reign the proportion was 2–1. In modern times, the approximate ratio is 4–1. It was formerly thought that a mixture of silver with B.-metal sweetened the tone, but it has been proved that silver in any quantity is injurious to

the tone of a B., great or small. Bs. have also been made of antimony, brass, steel, gold, and thick glass. Bs. cast of steel have a beautiful tone but a less sustained vibration. The casting of Bs. in England was originally practised in monasteries. It was then adopted as a trade by itinerary artificers, who wandered about the country casting Bs. in places that required them. By the time of the Reformation there were B. foundries in York, Norwich, Bury St. Edmunds, and other places. The art of casting has made little advance in modern times, and no Bs. of modern manuf. are better than those cast four hundred years ago. The B. is first designed on paper; a core is then constructed of brickwork, covered with soft clay, which is moulded to the exact form of the interior of the B. to be cast. Over the core is fitted a soft model of the future B. Then a third heavy shell, moulded to the required shape, is placed over the model; the model is removed, and molten B.-metal is run into its place and left to cool until it has set. The quality of the tone depends not only on the composition and weight of the metal, but on the shape and proportions of the B. The following are recognised to be fair proportions for a B.: the thickness of the edge to be one-tenth of the diameter, and the height twelve times its thickness. The prin. B. foundries in England at the present day are: Messrs. Mears & Stainbank, Whitechapel; Messrs. Taylor & Co., of Loughborough, who cast the Great B. of St. Paul's Cathedral, 1881; and Messrs. Warner & Co., Cripplegate.

History of bells.—Hand-Bs. or cymbals were used in early times for religious ceremonies. They were employed by the Egyptians at the festival of Isis. Aaron and the Jewish high priests wore golden Bs., alternating with pomegranate knobs on the blue robe of the ephod. The Gks. used Bs. in their camps; and the Roms. employed them to announce the hour of bathing, and as a signal to begin selling in the market-place. The introduction of B.-ringing into the Christian Church has often been ascribed to Paulinus, Bishop of Nola in Campania (A.D. 353-431), probably because *nola* and *campana* are late Latin words for B.; but the date of their introduction is a century later. They were introduced into Gaul about A.D. 500. In the 7th century, Bede mentions a B. brought by Benedict from Italy for his abbey at Wearmouth, and says Bs. were used at Whitley Abbey at the time of the death of St. Hilda, 680. Pope Sabinianus ordained the ringing of Bs. to announce canonical hours in 604. It appears that Bs. were not used in Switzerland and Germany for religious purposes till the 11th century. For a long time Bs. were comparatively small, and were often only hand-Bs. The *Clog-an-cadhachta Phatraic*, already mentioned, is 6 in. high, 4 in. deep, and 5 in. broad. The B. presented by a king in the 11th century to the church of Orleans, was considered remarkably large in its age, and it weighed 2600 lbs. Larger Bs. began to be cast in the 13th century. The largest B. in the world is the *Tsar Kolokol* of Moscow, which was cast in 1733. It is 21 ft. high, 21 ft. in diameter, and weighs 432,000 lbs. In 1737, owing to a fire, it fell and sank into the ground; in 1837 a chapel was excavated below it, of which it forms the dome. Among other large Bs. are the *Amarapoora*, in Burmah, 260,000 lbs.; those at Rouen and Vienna, each about 40,000 lbs.; Montreal Cathedral, 28,560 lbs.; 'Big Ben' of the Houses of Parliament, 30,000 lbs.; and the Great B. of St. Paul's, 11,470 lbs.

The uses of bells.—Bs. have been chiefly associated with ceremonies of a sacred character. They were at one time consecrated, had sponsors, were sprinkled with water, anointed, and received names, in fact, a complete baptismal service was held over them. Many inscriptions on old Bs. are of great interest, and show that superstitious ideas prevailed as to the power of Bs. over evil spirits, in dispelling storms, and putting an end to famine, pestilence, etc. The *Passing B.* was rung in order to terrify evil spirits from the dying body, as well as to admonish the living. By the 18th century tolling took place after death, a custom which is still maintained. The *Sanctus* or *Sacring B.* was rung during the celebration of mass. The *Pardon B.*, of pre-Reformation date, was tolled before or after service to call men to pray for the forgiveness of their personal sins. Other Bs., connected with religious services, are the *Gabriel* or *Ave B.*, the *Vesper B.*, and the *Bridal* or *Marriage B.* Bs. were also employed for secular purposes. They were used as a call to arms, as a warning of danger, particularly of flood and fire, and by watchmen at night. The *Curfew* B., supposed to have been introduced by William the Conqueror, was rung at eight o'clock as a warning to men that it was time to extinguish their lights and go to rest. It was abolished by Henry I. in 1100. In some parts of England this anct. custom is still retained. Bs. were, and still are, attached to cows and sheep (usually only to the leader of the herd or flock), as a signal to the shepherd.

These Bs. or crotals are also attached to the front horse of a sleighing team in America and Northern Europe. The hanging of Bs., with wire connections, in houses was adopted during the 18th century, but has been replaced by the electric button.

The ringing of bells.—In many Eng. church towers and belfries a number of Bs. are kept, so that changes can be rung on a peal. Four Bs. give 24 changes, eight give 40,320, while twelve give 479,001,600 changes. The ringing of Bs. so as to admit changes was at one time a fashionable art, for the *School of Recreations or Gentleman's Tutor* has a chapter on 'Advice to a Ringer.' The first known work on the subject is *Tintinnologia*, pub. by Fabian Stedman in 1668. The muffled peal is effected by covering half the clapper with a cap of leather. The art of pealing Bs. has been carried to great perfection in England. Consult: Gatty, *The Bell*, 1848; C. Pearson, *Ringer's Guide to the Church Bells of Devon*, 1888; North, *English Bells and Bell Lore*, 1888; Briscoe, *Curiosities of the Belfry*, 1883; Pease, *Notes on the Uses of Bells among the Greeks and Romans*, 1904; Dr. Raven, *Bells of England*, 1906; *The Quarterly Review*, Sept. 1854; *Glossary of Technical Terms*, 1901. Schiller's *Song of the Bell* and Poe's *Bells* are famous poems on the subject, and there are numerous references to Bs. in English literature.

Bell, Alexander Graham (*b.* 1847), American scientist and inventor. Born on March 3, in Edinburgh, Scotland, he was educated at the Edinburgh High School and the Edinburgh and London universities. Removing with his father, Alexander Melville B., to Canada in 1870, he became professor of vocal physiology in Boston University in 1872, where his experiments resulted in the patenting of the telephone in 1876. He also invented the photophone and graphophone, and has written many papers on electrical matters and on research work in connection with deaf-mutes. Holds degrees from a number of British and foreign universities.

Bell, Alexander Melville (1819-1905), Scottish-American educationalist, born in Edinburgh, Scotland, on March 1. Lectured on elocution in Edinburgh University from 1843 to 1865, and from 1865-70 at the university of London. In 1870 he removed to Canada, becoming instructor of elocution at Kingston, Queen's College, and in 1881 he moved to Washington, D.C. He devised the system of 'visible speech,' by which deaf-mutes are taught to speak. Has written and pub. many papers on elocution and other educational subjects, including *Principles of Speech and Elocution*, 1849, and *Visible Speech: The Science of Universal Alphabetics*, 1867.

Bell, Andrew (1753-1832), a Scottish educationalist, born at St. Andrews, Scotland, on March 27, and educated at the university there. He spent some years as a tutor in Virginia, U.S.A., and returning, took orders in the Church of England, being sent to India in 1787, where he held eight army chaplaincies. In 1789 he was appointed chaplain of Fort Saint George in Madras, and superintendent of an institution for the education of the orphan children of the military. Being unable to obtain properly qualified assistants, he at last introduced a system of teaching the pupils through themselves, which proved highly successful. Returning to England, he pub. a pamphlet in 1797, *An Experiment in Education made at the Male Asylum of Madras*, which received scant attention. Joseph Lancaster founded a school on the principles, which he developed, and the movement grew rapidly. B. left a fortune of £120,000 to educational institutions in Scotland, and was buried in Westminster Abbey.

Bell, Sir Charles (1774-1842), educated at the High School, Edinburgh; became a surgeon under his brother John (*q.v.*); lectured on anatomy when quite young; in 1804 came to London. Appointed surgeon to Middlesex Hospital, 1814, and raised that institution to the highest repute. Was interested in military surgery, when wounded troops came home from Spain, and visited Waterloo immediately after the battle, where he did the wounded great service. Produced in 1821 his first well-known paper on the 'Nervous System,' read before the Royal Society: in this he enunciated many important discoveries. In 1824 he accepted the chair of anatomy at the London College of Surgeons. Pub. 1828-29, *Animal Mechanics*, *Bridgewater Treatise on the Hand*, *Illustrations of Paley's Natural Theology*. Returned to Edinburgh 1836; brought out a new ed. of his *Anatomy of Expression*. Died suddenly at Hallow Park.

Bell, Charles Frederic Moberly (1847-1911), manager of the *Times*, born in Alexandria; educated in England; returned to Egypt and entered business there in 1865. In 1875 he left commercial life and devoted himself to journalism, having already estab. a connection with the *Times*. In 1880 he was one of the founders of the *Egyptian Gazette*. He became famous as a *Times* correspondent during the Arabi revolt of 1882. In 1890 he returned to England as

manager of the *Times*, in succession to J. C. McDonald, and the rest of his life was spent in untiring devotion to the interests of that paper. His enterprises included the *Times Atlas*, 1895; a reprint of the *Ency. Brit.*, 1898; the *History of the S. African War*, 1900-9; and the *Times* Book Club, 1905. In 1908 he became managing director of the reconstructed *Times* Publishing Company.

Bell, Currer, *see* BRONTË.

Bell, George Joseph (1770-1843), born near Edinburgh: became member of the Faculty of Advocates, 1791. Pub. many works on Scots law; appointed in 1821 professor of Scots law at Edinburgh, and in 1831 a principal clerk of Session.

Bell, Henry (1767-1830), one of the originators of steam-navigation. Born at Torphichen Mill, Linlithgow, and after spending some years as a stonemason, apprenticed to his uncle, a millwright. Later he served with an engineering firm in London, and in a shipbuilding yard at Borrowstounness. In 1709 he settled in Glasgow, but removed in 1807 to Helensburgh, where he studied mechanics. In 1812 the *Comet*, a small vessel 40 ft. long, built under his direction and with an engine constructed by himself, was launched on the Clyde, being the first steam vessel in Europe.

Bell, Henry Glassford (1803-74), a Scottish lawyer, born on Nov. 8 in Glasgow; he was educated at the High School there and at Edinburgh University. He founded and ed. the *Edinburgh Literary Journal* in 1828, and in 1832 was admitted to the bar, becoming sheriff-principal of Lanarkshire in 1867. Pub. 2 vols. of poems and a prose vindication of Mary Queen of Scots.

Bell, Sir Isaac Lowthian (1816-1904), was educated at Edinburgh and Paris, and afterwards founded the great Clarence Iron-smelting works on the Tees. In 1875 he was elected M.P. for Hartlepool, which he represented *till 1880, and in 1885* he was made a baronet. He has written a number of articles for scientific journals on chemical and metallurgical subjects. Among other honours, he has received the degrees of F.R.S. and D.C.L.

Bell, John (1691-1780), commonly called Bell of Antermony, followed the medical profession. In 1714 he went to St. Petersburg where he joined an embassy to Persia. Returned to St. Petersburg, where he was appointed to another embassy, this time to Pekin; returned to Moscow, 1722. Of these travels he wrote a most entertaining account. Returned to Scotland c. 1725. Undertook in 1737 another mission for Russia to Constantinople, where he settled as a merchant; married, 1746, and retired to Antermony. His travels were printed and pub. at Glasgow, 1763.

Bell, John (1763-1820), educated at High School, Edinburgh. Opened, 1790, a private school of anatomy; 1793 pub. the first vol. of his *Anatomy*; next *Discourse on the Nature and Cure of Wounds; Principles of Surgery*. Died of dropsy at Rome.

Bell, John (1797-1869), American politician, born near Nashville, Tennessee, he was educated at Nashville University. Elected to the state senate in 1817, and to Congress in 1827, where he served until 1841, becoming speaker in 1834 and secretary of war in 1841. He was nominated for the presidency in 1860, receiving the votes of Kentucky, Tennessee, and Virginia.

Bell, John (1811-95), an English sculptor, born in Hopton, Suffolk. His works are numerous and of high merit; among the better known being 'The Eagle Slayer,' 'The Babes in the Wood,' and 'Una and the Lion,' while statues of Lord Falkland and Sir Robert Walpole were commissioned for the Houses of Parliament. The memorial to the guards who fell in the Crimea is also by B.

Bell, John (1745-1831), a most enterprising publisher, who successfully defied a combination of London publishers, who called themselves 'the trade,' and attempted to secure a monopoly of the best books. It was for this combine that Johnson prepared an ed. of the poets and wrote the *Lives*. B., in opposition to this, brought out the *British Poets* in Bell's Edition, giving the chief poets from Chaucer to Churchill with the exception of a few that were copyright. It formed an attractive pocket ed., and similar issues of Shakespeare and the British theatre followed. B. was the first publisher to discontinue the use of the long *f* (s).

Bell, Joseph, Sir (1837-1911), a surgeon and author of medical works. He was appointed consulting surgeon to the Royal Infirmary and Royal

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are: *Manual of Surgical Operations* and *Notes on Surgery for Nurses* He was the prototype of Sir A. Conan Doyle's celebrated detective, 'Sherlock Holmes.'

Bell, Mackenzie, a poet and prose writer, born at Liverpool, 1850; has always been interested in imperial questions, and is one of the original members of W. E. Forster's Imperial Federation Committee. His chief works are: *Spring's Immortality and*

other Poems; Charles Whitehead, 1894; *Christina Rossetti*, 1898; *Pictures of Travel and other Poems*, 1898; *Collected Poems*, 1901; *School Recitations for the Seven School Standards*, ed. by Cornelius Lockington, 1908; *John Clifford: God's Soldier*, 1908; *For God and for the Commonwealth*, 1909; and *Poems* (with dedicatory essay to Theodore Watts-Dunton), 1909.

Bell, Robert (1800-67), a distinguished Irish journalist, born at Cork on Jan 16, and educated at Trinity College, Dublin, where with others he founded the Dublin Hist. Soc. In 1828 he became editor of the *Atlas* in London, contributing to Lardner's *Cabinet Cyclopædia*. He died in London, April 12. The best known of his works are a *History of Russia*, 3 vols.; *Lives of the English Poets*, 2 vols.; and a *Life of Canning*, while he also wrote two novels and three comedies.

Bell, Robert, geologist, was born at Toronto in 1841. He has made very extensive topographical and geological surveys in nearly all parts of Canada; was medical officer, naturalist, and geologist to the *Neptune*, *Albert*, and *Diana* expeditions, 1884-97, and has surveyed many of the rivers and some of the largest lakes of the dominion. R. B. has pub. upwards of 200 reports and papers, mostly on geological, biological, and geographical subjects, together with folklore. He is king's gold medallist of the Royal Geographical Society of London. Up to 1908, when he retired from service on a pension, he held the office of chief geologist to the dominion of Canada.

Bell, Robert Charles (1806-72), Scottish engraver, born at Edinburgh. He engraved a series of Scottish views and a large number of vignette portraits, and also many plates for the Royal Scottish Association, which attracted considerable attention. The largest work he undertook was an engraving of 'The Battle of Prestonpans,' after Sir William Allan. This had received his attention from time to time for some years before his death, and was only completed a short time before that event. Between the years 1850 and 1872 a number of his best plates appeared in the *Art Journal* (*q.v.* 1872, p. 284), including 'The Philosopher,' after H. Wyatt, 'The Bagpiper,' after Sir David Wilkie, and 'The Young Brother,' after Mulready, from the pictures in the Vernon Gallery.

Bell, Thomas (1792-1880), a celebrated zoologist, born at Poole in Dorsetshire. He was appointed dental surgeon to Guy's Hospital, London, in 1817, and professor of zoology at King's College in 1836. In 1828 B. was elected F.R.S., and from 1853-61 was president of the Linnean Society. Among his works are *British Stalk-eyed Crustacea; British Quadrupeds*; and parts 1-8 of *Monograph of Testudinata*.

Bell, Book, and Candle refers to a form of excommunication in the Church of Rome, in which an ecclesiastic, after pronouncing his malediction, closes his book, throws a lighted candle to the ground, and tolls the bell as for the dead. The symbolic significance of the first two actions is that the anathematised person is removed from the book of life, and his soul is cast from the sight of God as the candle from the sight of men.

Bella, It. tn. in the prov. of Potenza, 16 m. S.S.W. of Melfi; pop. 5000.

Bella, Stefano Della (1610-64), *b.* at Florence. Was one of the best masters of the etching-needle, and has been surpassed by few in the number of his works; their number is given differently by different writers, but they probably amount to about 1500; and, though he did so much, what he did he did well.

Bellac, the cap. of an arron. in the dept. of Haute-Vienne, France. Pop. (1901), commune, 4791.

Belladonna, *Atropa B.*, dwale, or deadly nightshade, a perennial plant of the order Solanaceæ, found in Europe and Asia, and cultivated in the United States for the sake of the alkaloids contained in its leaves, branches, and roots. The name is derived from the It. *bella donna*, beautiful lady, owing to the fact that administering the juice to the eye has the effect of dilating the pupil, thus giving it a large and lustrous appearance. The plant is used in medicine in the form of leaves, gathered when the plant is in flower and allowed to dry; the green extract prepared from the juice of the fresh leaves and branches; tincture of leaves prepared by adding one-third of its bulk of alcohol to the juice; the root, collected in autumn and dried; and the extract, tincture, liniment, and ointment prepared from the root. The active principles of the plant are chiefly atropine and hyoscyamine, but traces of hyoscine and belladonnine are also found in the root. The effect of these drugs, when applied locally, is to lessen the sensibility of the sensory nerves, and they are therefore used as anodynes. Large doses stimulate the nerve centres; the heart first becomes excited and is ultimately paralysed. B. and atropine are used as antidotes for opium poisoning, but must be taken only in small doses. The use of B. liniments and plasters is not unattended with

danger, as the poison is freely absorbed by the unbroken skin. For neuralgic pains, however, a plaster of *moderate strength is of great* service in giving relief.

Belladonna Lily, or *Amaryllis B.*, is a native of Cape Colony and belongs to the order Amaryllidaceæ, the single species of its genus. It is devoid of a corona, and is zygomorphic, in which it differs from its allies, the daffodil and snowdrop.

Bellagio, a vil. of Italy, beautifully situated on the promontory dividing the two arms of Lake Como. The vil. is well known and contains many large and magnificent villas. Pop. of commune about 3550.

Bellahouston, an eccles. parish of Lanarkshire, Scotland, 2 m. S.W. of Glasgow, of which it forms a suburb; pop. 8400.

Bellaire, a city on Ohio R., Ohio, U.S.A., and a shipping centre for the Belmont co. coalfield. Its manufs. are glass, agric. machinery, pig-iron. Beds of coal, limestone, and fireclay are in the neighbourhood. Pop (1900) 9912.

Bellamy, Edward (1850-98), an American social reformer and author, born at Massachusetts, U.S.A. He studied at New York and Germany. He attracted great attention by *Looking Backward*, 2000-1887, in which book he pictured life under socialistic conditions. His later years were spent chiefly in lecturing. In 1897 *Equality*, sequel to *Looking Backward*, was pub., and the following year he died at his birthplace.

Bellamy, Mrs. George Anne (c.1727-88), was the illegitimate daughter of Lord Tyrawley, and educated at a Fr. convent. She lived with her mother in London, and associated with Mrs. Woffington and Garrick. She became a famous actress, and, till 1770, played in London, Edinburgh, and Dublin. Her extravagance and licence, which were as renowned as her career was brilliant, caused her much sorrow and poverty in her later years. Released from the debtor's prison in 1785, she pub. her *Apology*. She died in February.

Bellamy, James, was born at Flushing, of poor parents. His first verses were effusions of patriotic feelings and love for his native country. Some wealthy citizens of Flushing were so much pleased with these first productions of the young poet that, to encourage his talent, they resolved to send him, at their own expense, to a university. Accordingly he went to Utrecht, with the intention of studying divinity. These studies, however, he soon left for the more congenial pursuits of poetry and general literature. He ranks among the first poets of his nation and the restorers of modern Dutch poetry. He died in 1786.

Bell Animalcules, *see* VORTICELLA.

Bellarmin, Robert, Cardinal (1542-1621), born in Tuscany. He entered the order of Jesuits in 1560; was ordained priest at Ghent by Jasenius in 1569, and elected professor of theology at the University of Louvain in the year after; having filled this chair for seven years he went to Rome in 1576, where he gave lectures on controversial theology. He died at Rome.

The controversial works of B. fill three large folio vols. Of their merits, and of the merits, intellectual and moral, of their author, we have a favourable opinion from the learned and candid Mosheim (Mosheim, *Eccles. Hist.*, vol. iii. p. 155, Maclane's translation).

Bellary, a dist. and tn. in British India. The town is 300 m. from Madras by rail, and is one of the chief military stations of that presidency. It possesses two forts. The upper fort, built on the summit of a rock, rises 450 ft. from the ground. The supply of water is obtained from cisterns excavated in solid granite. The lower fort contains the barracks. A branch of the Madras Railway terminates at B. Iron, copper, antimony, etc. are found in the dist., and its manufs. are cotton and woollen goods, salt, and chintz stamping. Pop. 58,750.

Bellasis, Edward (1800-73), Eng. sergeant-at-law. He was educated at Christ's Hospital, and was called to the bar in 1824. His success commenced from the first, and the famous cases where he was conspicuous number over 350. He became sergeant-at-law in 1844. From 1833 to 1845 he was interested in the Oxford movement, and became acquainted intimately with Newman, Pusey, Ward, and Manning. He left a peculiarly interesting autobiography and a number of theological treatises, besides taking a prominent part in the controversy aroused by the bull of Pius IX. in 1850. He died, after a period of ill-health, at Provence.

Bellatrix is γ Orionis. It is a white star of the second magnitude in the left shoulder of Orion.

Bellay, Joachim du, a Fr. writer and poet, was *b. c.* 1525. He was a friend of Ronsard, next to whom he was the chief member of that famous society, the Pléiade, a society formed to create a Fr. school of renaissance poetry. At this time he wrote the *Défense de Illustration de la Langue Français*, 1549. In this prose work he explained the aims of the Pléiade. His later works are *Les Antiquités de*

Rome, which was trans. by Spenser, and entitled *Ruins of Rome; Regrets*, pub. in 1559, and *Les Jeux Rustiques*, in 1560.

Bell-bird, the name given to sev. birds on account of their notes, but applied in particular to the *Chasmorhynchus niveus*, a species of Cotingidæ. It is a white, frugiferous bird, and is noted for a curious long black fleshy appendage dotted with feathers which hangs from its forehead. When the bird utters its cry this caruncle becomes elongated. *See* article by J. J. Quelch in the *Field*, 1892.

Bell-Casting, *see* BELL.

Belle Alliance, the name of a farm, was the centre of the position of Napoleon's army at the battle of Waterloo. It lies 13 m. S. of Brussels. At B. A. the great generals Wellington and Blucher met. The battle of Waterloo, and subsequent victory, has been spoken of as the B. A. by the Prussians.

Belleek, a parish in the N.W. of Fermanagh co., Ulster. It is situated on the R. Erne, 20 m. N.W. of Enniskillen. It is a market town, and has a pop. of 1980.

Bellefontaine, a tn. of Logan co. Ohio, U.S.A., 49 m. N.W. of Columbus; pop. 5000.

Bellegarde: 1. A fortress, situated on a peak, 1380 ft. above the sea, in the dept. of Pyrénées-Orientales, France, on the Spanish border, 17 m. S. of Perpignan. Philip III. of France was defeated in the neighbourhood by Peter III. of Aragon (1285). The fortress was captured by the Spaniards in 1793, but was retaken, 1794. 2. A tn. in the dept. of Ain, France, on the Swiss border. Pop. about 3000.

Belle-Ile- (or Belle-Isle) en-Mer, an is. of France, belonging to the dept. of Morbihan, in the Atlantic Ocean, 8 m. S. of Quiberon Point. Its length is nearly 12 m. and its greatest breadth about 7 m. The chief industry is pilchard and sardine fishing; fine draught-horses are reared; and the soil is fertile and well cultivated. Admiral Hawke defeated the Fr. fleet under Conflans off the coast in 1759; the is. was captured by the Eng. in 1761, but restored to France two years later. The chief tn. is Le Pallais. Pop. (1901) 9771.

Belle Isle: 1. A small is. in the Atlantic, lying between Newfoundland and Labrador, about 15 m. from either coast. Area, about 15 sq. m. There is a lighthouse, 470 ft. high, visible at a distance of 28 m. The true breed of Newfoundland dogs originated in this island. 2. An is. in Conception Bay, near the S.E. extremity of Newfoundland. It is about 6 m. long by 3 m. broad. The soil is fertile, and there are rich deposits of hematite iron ore. The cliffs are rocky and imposing, some standing 400 ft. high. Pop. 1500.

Belle Isle, Strait of, a channel between Newfoundland and Labrador, forming an entrance to the Gulf of Saint Lawrence from the Atlantic Ocean; it is the main route from Great Britain to the Saint Lawrence R., but during the winter months, it is blocked with ice. It is about 80 m. in length, the breadth varying from 10 to 18 m.

Belle-Isle, Charles Louis Auguste Fouquet (1684-1761), Marshal of France, a grandson of the intendant Fouquet, was *b.* at Villefranche. After distinguishing himself in the wars of the Spanish Succession, he was made governor of Metz and a marshal of France. He, with Broglie, had command of the forces in the war of the Austrian Succession, and stormed Prague in 1741. In the year following he led the brilliant retreat to Eger. He became minister of war in 1758, and then made sev. improvements in military service.

Bellême, or Bellesme, a tn. in France, in the dept. of Orne. It was besieged in 1228 by the army of Louis IX. of France. To the N. is the small forest of B., where there are some mineral springs. Pop. about 2600.

Belleme, Robert, Earl of Shrewsbury. He was knighted by the Conqueror in 1073. During Rufus's reign he became the most powerful lord in the realm. In 1102 he lost his Eng. estates and returned to Normandy. He died in prison, where he had been incarcerated by Henry II.

Bellenden, John, a poet and author, was born towards the end of the 15th century. He was of Scottish extraction and educated at St. Andrews and Paris. He is better remembered as a translator, having been authorised by James V. to translate Boece's *History of Scotland*, and also Livy. He became canon of Ross and archdeacon of Moray. As a result of religious disputes he removed to Rome, where it is supposed he died.

Bellenden, Sir John (*d.* 1577), eldest son of Sir Thomas Bellenden of Auchinvole; some time secretary to Archibald Douglas, Earl of Angus, prime minister of Scotland. In 1547 he was made a Lord of Session by the queen regent; at the beginning of the Reformation he supported the royal party, but in 1560 he joined the reformers; in 1651 Mary Queen of Scots appointed him one of her privy council, and he was supposed to be implicated in the murder of the queen's favourite, Rizzio; he fled from Edinburgh, but was soon restored to favour, and supported the queen's marriage with Bothwell.

Bellenden, William, professor of humanity, who *fl.* in the early part of the 17th century. He held a chair at the university of Paris, and was favoured by James I. of England. He is now principally remembered (if he is remembered at all) as a writer on Cicero. Dr. Parr edited his works in 1787, with a preface of political invective, *more suo*, against Pitt, asserting, *inter alia*, that Middleton in his *Life of Cicero* borrowed from B. without acknowledgment.

Bellerophon, a genus of fossil gastropod mollusc. which is the typical genus of the family Bellerophontidæ. The species occur exclusively in the Palæozoic formations.

Bellerophon was the son of Glaucus, King of Corinth, and Eurymede. His name was changed to B. from Hipponous, after having killed Bellerus by accident. He was sent to Proetus, King of Argos, and unwittingly won the love of Antea, wife of Proetus. He spurned her advances, whereupon she sought to turn her husband against him. Proetus sent him to Iobates, King of Lycia, with sealed instructions to put B. to death. Iobates was unwilling to kill him directly, so imposed upon him the almost impossible task of killing the monster Chimæra. But by the aid of Pallas, who gave him the winged horse Pegasus, he succeeded in slaying the monster. He defeated the Amazons, and cut down the Lycian ambuscade. Thereupon the king ceased to attempt his death and gave him his daughter Philonoë in marriage. Three children were born. According to later stories B. caused the anger of the gods to fall upon him, and he was driven out to wander alone through the Aleian fields. He attempted to fly to heaven on Pegasus, but was overthrown and stricken with blindness.

Belles Lettres, a somewhat vague term, borrowed by the English and other languages from the French, signifying any writing of a refined or elegant character, but more particularly applied to essays, poetry, and criticism.

Belleville, formerly a suburb of Paris, now the eastern quarter of that city; it is inhabited chiefly by poor people.

Belleville, a tn. of Essex co., New Jersey, U.S.A., 3½ m. N.E. of Newark; pop. 4000.

Belleville, a city in St. Clare, Illinois, U.S.A., 15 m. S.E. of St. Louis. There are large flour mills, and manufs. of heavy iron goods, threshing machines, etc. Coal is found in the dist. Pop. 18,756.

Belleville (Ontario) is a prosperous tn. situated on the Bay of Quinte and the Moira R. It has splendid railway and water communication. The Albert University was founded here in 1857. Pop. 9520.

Belleville-sur-Saone, a tn. of France in the dept. of Rhone, on the R. Saone; pop. (commune) about 3000.

Bellevue, a tn. in Campbell co., Kentucky, U.S.A., near Newport; pop. 4000.

Bellew, Harold Kyrle (1855-1911), Eng. actor. *b.* at Prescot, Lancashire; entered the navy, and later went to Australia, where he first appeared on the stage in 1874. He returned to England in 1875, and secured an engagement under Helen Barry. In 1878 he joined Henry Irving's company at the Lyceum, and in 1879 Marie Litton's at the Imperial. From 1885-87 he visited America, and on returning formed a touring company with Mrs. Brown-Potter. The partnership broke up in 1898, when he appeared successively at the Criterion and Lyceum. From 1902 till his death he played in America.

Belley, *a tn. in the dept. of Ain,* France, 44 m. E. of Lyons. It is the seat of a bishopric, and has a cathedral dating from A.D. 889, and the ruins of an anct. Rom. temple. An excellent quality of lithographic stone is quarried in the neighbourhood. Pop. (1901) 6467.

Bell-flower, a name sometimes applied to different species of Campanula because of their bell shape. *C. rotundifolia* is the Scottish bluebell; *C. medium* the Canterbury bell.

Belli, Giuseppe Gioachino (1791-1863), an It. poet, born at Rome. The majority of his poetry is written in the Roman dialect; he also wrote satirical sonnets. See *I sonnetti romaneschi* (1886-9) ed. by Morandi.

Belligerent. This term is applied to a nation at a time of war. Its application is very significant, marking an important distinction in international law between a gov. at war, and a subject state or race in a state of rebellion. In the case of a gov. engaging in warfare, the Bs. must be controlled by the laws of war, and in the interests of humanity they are compelled to conduct the whole campaign strictly on the approved methods of civilisation. At the same time, they are also brought under distinctly defined obligations in respect to other and neutral powers. The recognition of the B. parties by neutrals is greatly advantageous, in that it ensures the support—moral, and if necessity demands, the material assistance—of the latter in the event of the violation of the laws of warfare. A B. can claim the right to use every means which to him appears necessary to subdue his adversary, and to bring him to

terms. This is the broad and extensive right of Bs., though it is very much modified in the civilised states, by the humane usage of nations, and also by international agreement. Great Britain accorded the status of B. to the Confederate States of America in 1861.

Belligerents, Rights and Duties of. The conduct of war involves the relations first between the two parties engaged in the war, the B., and secondly between either or both those parties and neutrals. The latter is discussed under NEUTRALITY and CONTRABAND. The latest regulations adopted for the conduct of a war, in the endeavours to make it as humane as possible, are contained in the articles of the Hague Convention, 1907, embodying or modifying the convention of 1899. It must be remembered that in actual warfare military necessity, the exasperation of feelings among an invaded population may result in the breaking down of rules agreed to by diplomatists or representatives in time of peace. The armed forces of the B. must alone carry on the war, and to them alone do the rights, duties, and laws of war apply; beside the regular army, militia or volunteer forces may be regarded as B. troops, and not as mere marauders only, if they are commanded by some one responsible for his men's acts, if they carry emblems distinctive and recognisable at a distance, carry arms openly, and conduct war in accordance with accepted laws and customs. The last two conditions will suffice when the population of an invaded country take up arms and have not time to organise under the other conditions. Enemy's property on land, where it belongs to the state, can be seized by an army of occupation; also all appliances for transmission of news, persons, or goods, and ammunitions of war belonging to private persons can be seized, but must be returned with compensation after peace. Requisitions in kind or services on private persons can only be made for the necessities of the army, and paid for on receipts given, to be paid afterwards. Private property on land is not strictly immune in war. On sea, enemy's private property is still liable to capture and confiscation, though there is a movement to exempt it. It is forbidden to use poison or poisoned arms; to kill or wound persons belonging to the enemy's nation or forces treacherously, or those who have surrendered at discretion; to declare 'no quarter' shall be given; to use arms or projectiles, etc., which will cause superfluous injury; improper use of flags of truce, enemy's flags or uniforms, or red-cross badges; bombardment of undefended places or dwellings, except on a refusal after formal summon to furnish supplies requisitioned; destruction and seizure of property except when urgently necessary for purposes of war; pillage of a tn. or place, even if taken by assault. Prisoners of war must be treated humanely; they are in the power of the enemy's gov. not of those that took them; they may be confined, but only as a measure of necessity; they may be authorised to work, but not for any purpose of the war; they are treated on the same footing as the soldiers of their captors in respect of food, etc. Escaped prisoners are subject to punishment if caught before rejoining their own army or before leaving the country occupied by their captors; if captured a second time after escaping successfully, they are not liable to punishment for first escape. A prisoner released on parole and recaptured bearing arms forfeits his rights as a prisoner of war. For treatment of sick and wounded in war *see* GENEVA CONVENTION; it may be noted that the Hague Convention, 1907, drew up rules on the lines of the Geneva Convention for the treatment and conduct of hospital ships and of sick and wounded in naval warfare.

Bellingham, a parish and mrkt. tn. of Northumberland, on the l. b. of the N. Tyne. The church dates from the 13th century and has a finely groined roof. Cairns and Druidical stones are found in the neighbourhood. Beds of coal and ironstone are worked.

Bellini, Gentile (1421-1501), eldest son of Jacopo B., was born at Venice. He studied painting under his father, and acted for some time as his assistant, but subsequently gained such reputation by his original works that he was employed, in conjunction with his brother, Giovanni, to decorate the great council chamber of the Venetian senate house. His other prin. works are the 'Histories of the Holy Cross' at San Giovanni, and the 'Preaching of St. Mark' at the college of that saint. Some of B.'s pictures were taken by commercial speculators to Constantinople, where, having been seen by the sultan, Mohammed II., that monarch sent an invitation to the artist to his court. This proposal was accepted by B. He was courteously received by the sultan, who sat to him for his portrait, and commissioned him to paint various historical works. Among the rest was the subject of the 'Decollation of St. John;' this picture being completed was greatly admired by Mohammed, who pointed out, nevertheless, some inaccuracy in the marking of the dissevered neck; and, in order to prove

the justice of his criticism, he ordered the head of a slave to be struck off in the presence of the astonished artist. From this moment B. never enjoyed an hour's tranquillity until he had obtained leave to return to Venice. Mohammed dismissed him with many marks of favour, placing a gold chain round his neck and giving him letters to the Venetian senate expressive of his satisfaction. He was engaged in various public works after his return to Venice, for which he was requited by the republic with an honourable pension for life and the order of St. Mark.

Bellini, Giovanni (1422-1512), the son of Jacopo and the brother of Gentile B., born at Venice. He contributed perhaps more than any painter of his time to emancipate art from the dry Gothic manner of his predecessors. Giovanni ornamented the public edifices and churches of Venice and other cities of Italy with a prodigious number of paintings, and continued his labours to a very advanced age. Some of his small pictures are in England; but it is only by his large works in Italy that an adequate idea of his power can be formed.

Bellini, Jacopo, born in Venice, was one of the earliest artists in oil painting, and his works have considerable merit, considering the age in which they were executed. He died in 1470.

Bellini, Laurentio (1643-1704), descended from a respectable family, was born at Florence. After receiving in his native place the elements of a classical education, he proceeded to Pisa, where he made such rapid progress in his studies that, when only twenty years of age, he was appointed professor of philosophy. He continued to teach anatomy and to practise medicine at Pisa, with great success, for thirty years, when he was invited to Florence and made chief physician to the Grand Duke Cosmo III. He died on Jan. 8.

The writings of B. are now little read. The best is the treatise *Gustus Organum novissime deprehensum* (Bologna, 1665), in which he pointed out the papillæ of the tongue to be the essential organ of taste. The next

Urinis, Febri-

works have been collected and pub. in 2 vols. 4to, *Opera Omnia* (Venice, 1708), and reprinted 1732.

Bellini, Vincenzo (1806-36), a composer of considerable celebrity, born at Catania, in Sicily. B. was educated in the Conservatorio at Naples, under Zigarelli, and in that city, before he had completed his twentieth year, he produced an opera, *Bianca e Fernando*, at the theatre San Carlo. The following year he wrote for the Scala at Milan *Il Pirata*; and this was succeeded by *La Straniera* at the same; *La Sonnambula* at Naples; *I Capuletti ed i Montecchi* at Venice; *Norma* at Milan; *I Puritani* for the Theatre Italien at Paris, etc. He died of pulmonic disease.

Bellinzona can. of the Swiss canton of Ticino or T head of Lagc elevation of St. Gotthard route. There are three old castles. Pop. (1900) 4956.

Bellis, a genus of herbaceous plants of the order *Compositæ*, of which *Bellis perennis*, the common daisy, is the best known. It grows abundantly in Great Britain and throughout Europe in both a wild and a cultivated state. The florets of the ray are male, and the head of the daisy closes in wet weather and at night.

Bellman, Charles Michel (1741-96), a Swedish poet, born at Stockholm. He studied at the university of Upsala, and after he had left it was enabled to devote himself entirely to his favourite pursuits of poetry and literature by the liberality of Gustavus III., who appointed him to a nominal office, with a competent income and the title of secretary of the court.

Bell-Metal, an alloy, composed of a mixture of copper and tin, used for making bells. There is from 18 per cent. to 30 per cent. tin, with 80 per cent. to 70 per cent. copper, the proportion of tin being larger in the case of small bells. *See also* ALLOY.

Belloc, Hilaire, Eng. writer, was orn in 1870. After a brilliant career bat Oxford, where he took first-clas honours in history, he served for some years in a Fr. artillery regiment. In 1906 he was elected M.P. for South Salford. Publications include: *The Bad Child's Book of Beasts*, 1896; *The Modern Traveller*, 1898; *Danton*, 1899; *Robespierre*, 1901; *The Path to Rome*, 1902; *Mr. Clutterbuck's Election*, 1908; in conjunction with Cecil Chesterton, *The Party System*, 1911; *The Girondins*, 1911; *The Four Men*, *The Servile State*, 1912.

Bello, Francesco (*c.* 1450-1505), It. epic poet, known as Cieco da Ferrara on account of his blindness. Lived in great poverty at Mantua and Ferrara. He is chiefly interesting for his *Mambriono* (45 cantos), which, dealing with the romantic and chivalrous adventures of an Oriental potentate, had a considerable influence on Ariosto's *Orlando Furioso*.

Bello Horizonte, the cap. of Minas Geraes, Brazil, 50 m. N.W. of Ouro Preto. It contains an academy of law. Pop. 26,000

Bellona, the goddess of war among

the Roms., the sister or wife of Mars. The goddess was usually represented as wearing a helmet, and bearing a shield in one hand and a fire-brand or a spear in the other. During the Samnite War (296 B.C.) Appius Claudius vowed to dedicate a temple to her, and it was afterwards erected (293 B.C.) in the Campus Martius. Her priests were called Bellonarii, and her festival, which was held on March 20, was celebrated by self-inflicted human wounds, and by offerings of blood in sacrifice.

Bellot, Joseph René, a Fr. naval officer and Arctic explorer, born at Paris in 1826. He won the Cross of the Legion of Honour in the Fr. expedition against Tamative in 1845. In 1851 he joined the party in search of Sir John Franklin. In March 1853, while on the expedition under Capt. Inglefield, he perished. An obelisk was erected at Greenwich to his memory.

Bellot Strait, discovered by Joseph Bellot, on the N. of N. America, separates N. Somerset from Boothia Felix, and connects Prince Regent Inlet with Franklin Channel.

Bellows, *see* BLOWING MACHINES.

Belloy, Pierre Laurent Buirette de (1727-75), born at Auvergne. He was intended for the legal profession, but he preferred the stage. He was among the first to introduce successfully on the Fr. stage native heroes. For sev. years he played principally at St. Petersburg under the name of Dormont. His tragedy, *Titus*, which was introduced in France in 1758, was a failure, and thus disappointed B. returned to Russia. His next play, *Zelmire*, in 1762, was successful, and the *Siège de Calais*, in 1765, was rewarded with still greater applause. Through this last piece he received the freedom of the city of Calais. His death took place at Paris.

Bell Rock, or Inchcape Rock, a reef off the E. coast of Scotland, at the opening of the bay formed by the Red Head in Forfarshire and Fifeness, nearly opposite the mouth of the Tay. It is nearly 12 m. S.E. of Arbroath, and is about 2000 ft. long. A lighthouse, 120 ft. high, designed by Robert Stevenson and Rennie, was erected in 1810; a new light-room was built in 1902. The old tradition of the bell hung on a tree by the Abbot of Aberbrothock (Arbroath) is celebrated in Southey's famous ballad, *The Inchcape Bell*. Consult Campbell, *Notes on the Bell Rock*, 1904.

Bells, a nautical term, used in describing the time. A day on board ship is divided into watches of four hours each. Every watch is marked off into half-hours by the ringing of a bell, the strokes of which depend on the number of half-hours that have elapsed during the watch. Thus, 'two-bells,' marked by a double stroke, shows that one hour of the watch has expired.

Bells, The: 1. Name of a poem by Edgar Allan Poe. 2. Title of the Eng. translation of Erckmann-Chatrian's *Le Juif Polonais*. It tells how the Jew was murdered by an innkeeper whose tavern he was leaving in his sleigh. The haunting sound of the sleigh bells drive the murderer mad. Sir Henry Irving created the part of Mathias, the innkeeper.

Bellshill, a tn. of Lanarkshire, Scotland, 3 m. N. of Hamilton, in the mining district. Pop. 3500.

Belluno, a prov. of N. Italy in Venetia. Area 1293 sq. m. The country is mountainous, and there are extensive forests. The chief riv. is the Piave, which rises in the Alps and flows into the Gulf of Venice. The vine and other fruit-trees grow on the lower hills and in the valleys, and there is good pasturage. Pop. (1901) 214,603. The cap. is B., an episcopal city, standing on the r. b. of the Piave, 51 m. N. of Venice. The cathedral belongs to the Renaissance period, and is modelled on the Palladium. The prin. manufs. are silk and wax, and there is also considerable trade in timber and fruit. The tn. is the Rom. Belunum. Marshal Victor took from it his title of Duke of B. Pop. (1901), commune, 18,747.

Belmez, a tn. with large coal mines in the prov. of Cordoba, Spain, 35 m. N.W. of Cordova. Pop. 12,000.

Belmont, a settlement in the dist. of Herbert, Cape Colony. It is situated on the railway to Kimberley, and 58 m. S.W. by S. of that town.

Beloit, chartered as a city in 1856, it stands on the Rock R., Wisconsin, U.S.A. It is 75 m. S.W. of Milwaukee. B. College was founded in 1846; it is a Presbyterian institution, and accommodates 500 students. The manufs. of B. are agricultural tools, flour, and paper. Pop. 10,525.

Belomancy (Gk. *βέλος*, dart, *μαντεία*, divination), divination by means of arrows, a form of magic practised by early races, such as the Alans, Babylonians, and Scythians. Nebuchadnezzar applied to B., when he 'stood at the parting of the way . . . to use divination: he made his arrows bright' (Ezekiel xxi. 21).

Belon, Pierre, one of the fathers of natural history on the revival of letters, born at a hamlet in a parish of the Fr. prov. of Maine, somewhere about the year 1518. Deservedly great as is the fame which he acquired, nothing seems to be known concerning his family, which is generally considered not to have been of note.

belt is used up in bending the belt over the curve of the pulley. The actual resistance of the belt to curving may be neglected in the case of thin flexible leather or woven belting, but at high speeds centrifugal force tends to reduce the pressure of the belt on the pulley, and it is probable that at about 10,000 ft. per minute for leather belts, the belt tension would be so much reduced that the belt would cease to drive. Belts may be used to drive pulleys which are at right angles to the driving shaft, in which case the belt takes a quarter twist. When two pulley shafts are not parallel, whether their directions intersect or not, the belt may be passed round and kept in place by guide-pulleys. The only condition to be observed is that the point at which the belt leaves each pulley must be in the same plane as the next pulley.

Materials.—Belts are usually made of leather tanned by oak-bark; the thickness varies from $\frac{1}{32}$ to $\frac{1}{2}$ in. in single belting and twice that amount in double belting. The strength of single belting is from 750 to 1500 lbs. per sq. in. of width. Raw-hide is sometimes used, and is of considerable strength. The strips of leather are joined by paring down the ends cementing them together with glue, and lacing or riveting them to make them more secure. It is usual to leave one joint uncemented, so that the belt may be tightened when required. Leather belts are usually run with the flesh side next to the pulley, but in America experiments appear to show that the driving power is greater with the grain or smooth side in contact. Cotton belting has the advantage of being cheaper and stronger than leather, 8-ply cotton belting being found by the manufacturers to be twice as strong as double leather belting. India-rubber is sometimes used in wet places, where leather is unsuitable, but is easily damaged by contact with oil. Chain belting consists of links of leather strung together on wire pins which are not bent as the belt passes over the pulley.

Pulleys.—A belt passing round a conical pulley in motion has a tendency to creep up to the larger end. Pulleys are therefore made with the rims slightly convex, so that the belt remains in the middle of the rim. The arms may be elliptical or segmented in section, and the latter form is usually preferred. They may be straight or curved; the former are stronger and lighter, but are more liable to fracture on cooling. Pulleys are sometimes cast in two halves, so that they may be fixed on a shaft without interfering with the shaft bearing. Wrought-iron pulleys are often made with split rims, which are closed up by [illegible] the pulley is [illegible] belt is throwi [illegible] pairs or tighte [illegible] the upper shaft. If this is the driving shaft there is a danger that the belt will be doubled round on itself by the rotation of the shaft and slung round with risk of damage to life or property. This may be obviated by the provision of a light perch above the shaft on which the pulley may hang when unshipped. Allied to systems of belting is the use of rope for gearing. The pulleys are then provided with grooves so shaped that the ropes do not reach the bottom, but are wedged in by the sides, and so give a very effective drive. Cotton ropes are very strong, but hemp and wire are also used. The rope may meet the pulley at an angle, so that the shafts need not be exactly parallel. Another advantage of rope gearing is that many ropes may be run from a driving drum to sev. machines. *See* W. C. Unwin, *The Elements of Machine Design*, part i. 1909.

Belts, Jupiter's, *see* JUPITER.

Belturbet, a tn. in co. Cavan, Ireland, 8 m. N.W. of Cavan, on the R. Earn. Pop. about 1500.

Beluchistan, *see* BALUCHISTAN.

Beluga, or the white whale, belongs to the family of Dolphins. It is found chiefly around Greenland, but occurs in many parts of the Arctic seas, and occasionally has been seen off Scotland. Its body measures 12 or 16 ft. in length, and is a creamy white colour. Its head is arched, its snout short and rounded, its teeth are comparatively few, small, and conical, and it has short flippers. Young whales are at first a bluish grey. Belugas associate in herds.

Belur, a vil. of the Hassan dist. of Mysore, which contains a famous temple. Pop. 4000.

Belur-Tagh, *see* BOLOR-TAGH.

Belus: 1. The name of the chief deity of the Babylonians and Assyrians. 2. In Gk. mythology, the son of Poseidon, and father of Ægyptus and Danaus. He was erroneously believed to be the founder of Babylon. The patronymic Belides is given to Ægyptus and Danaus; to Lynceus, son of Ægyptus; to Palamedes; and to the Danaides, daughters of Danaus.

Belvedere, in architecture, is a small building constructed at the top of a house or palace, and open to the air, at least on one side, and often on all. The term is an It. compound, signifying 'a fine view,' and in Italy it is constructed expressly for that purpose. The chief example is in the Vatican. In France the term is

applied rather to a summer-house in a park or garden than to the constructions on the tops of houses.

Belvedere, or *Kochia scoparia*, is a species of Chenopodiaceæ which is native to E. and Central Asia. It is cultivated in Britain as an ornamental plant on account of its leaves, which somewhat resemble those of a cypress: hence it is sometimes called the *summer cypress*.

Belvidere, a banking tn. and cap. of Boone co., Illinois, United States. Fine public buildings and factories. Pop. over 7000.

Belvisia, the *Napoleona imperialis*, is a species of Lecythidaceæ which grows in tropical W. Africa. It grows to a height of 7 or 8 ft and is loaded with large, broad, bright blue, red, or white flowers. The fruit resembles a pomegranate.

Belvoir Castle is situated 4 m. S. of Bottesford in Leicestershire. Since the time of Henry VII. it has been in the hands of the Manners family, and is now the seat of the Duke of Rutland. The castle itself is a fine castellated, pseudo-Gothic building. During the Civil War it was a royal stronghold, whilst its history goes back to the days when William the Conqueror granted its site to Robert de Todeni, who founded a priory, long since suppressed, at the foot of the isolated mound from which the castle commands so wide a prospect. Its picture gallery contains paintings by Vandyck, Murillo, Reynolds, Holbein, etc.

Belyta, a genus of hymenopterous insects of the family Proctotrypidæ. They are cosmopolitan, and their larvæ live in the bodies of insects and spiders or in their eggs. These parasites are very minute, have four wings, and frequent sandy places.

Belz, a small tn. of Galicia, Austria-Hungary, 39 m. N. of Lemberg.

Belzoni, Giovanni (*d.* 1823), born at Padua, but lived during his youth at Rome, where he intended to enter the monastic life, but in 1800 he left Italy and visited most countries in Europe. In 1803 he came to England and married; he lived by exhibitions of feats of strength. He was interested in hydraulics, and went to Egypt with a plan for irrigating that country: the jealousy of the natives frustrated his intentions. He shipped many monuments of Egyptian anct. civilisation to England, and discovered many unknown tombs along the course of the Nile. In England he published an account of his travels and excavations. He died at Gato on his way to Timbuctoo.

Bem, Joseph (1795-1850), a famous general of Polish origin, was born at Tarnow, Galicia. He was educated at the university of Craçow, and admitted as a cadet in the corps founded by Napoleon at Warsaw. After thirteen years military service, he took part in the Polish rebellion, 1830-31. He then left for Paris, where he lived for sixteen years. In 1848 he joined the Hungarians, and received command of 10,000 men. In 1849, he defeated the Austrians, driving them and the Russian allies into Wallachia. He also expelled Puchner from the Banat and returned to Transylvania. He was forced to retreat from such superior numbers, and escaped to Hungary, where he fought in the battle of Temesvar. Again he escaped to Turkey, and there embraced the Mohammedan faith. He was appointed to the Sultan's army as Amurat Pasha. He died at Aleppo.

Bembatoka, or Bombetok, a bay, situated in *lat.* 16° S., *and long.* 46° 30′ E. on the N.W. coast of Madagascar.

Bembex, the typical genus of the hymenopterous family of insects known as Bembecinæ. They are peculiar to hot climates and sometimes resemble wasps in size and colour. The female forms burrows in the sand with a cell at the bottom of each: here she deposits five or six flies she has killed, in each cell, lays an egg in it and closes the entrance. The larva, when hatched, feeds on the flies until it has become a perfect insect.

Bembo, Pietro (1470-1547), one of the celebrated Italian authors of the 16th century, the son of a Venetian patrician; studied at Padua and Ferrara, learning Gk. from Lascaris of Messina; he pub. a dialogue after the manner of Plato. He seems to have been fond of imitation, for he pub. imitations of Petrarch. At Urbino he became acquainted with Julian de Medici, brother to Leo X., whose secretary, by Julian's influence, B. became. He had many benefices, and in 1530 was commissioned by the Council of Ten to write the history of the Venetian republic; he wrote this in Lat., completing it up to the year 1513. In 1539 he became a cardinal. He died at Rome.

Bembridge Beds, is the geological name for a fossiliferous div. of the Upper Eocene strata, principally developed in the Isle of Wight. The beds rest on a compact cream-coloured limestone, known as B. limestone. The beds above this foundation have been arranged into three divs.; the first of marls and laminated grey clays, containing many melania turretissima; the second of unfossiliferous clays alternating with fossiliferous marls; the third of greenish marl, containing immense

quantities of marine mollusca, and known as the oyster bed. The shells of Lymnea and Planorbis are found in large quantities, but the distinguishing feature of the beds is the mammalian remains of Palæotherium and Anaplotherium.

Ben, Bein, or Bhein, a word in the Scottish dialect of the Gaelic language which has been adopted to indicate most elevated summits of mt. ranges. A corresponding term is 'Pen,' which occurs in the names of sev. places in Cornwall and Wales.

Ben, the first syllable in many Heb. names, and means 'son,' *lit.* or metaphorically, *e.g.* 'Benhadad' is the son, or the worshipper, of Hadad, or Adod, the chief idol of the Syrians. 'Benjamin' is son of the right (hand), *i.e.* son of happiness.

Ben, Oil of, *is extracted from the* seeds, called Ben-nuts, of a tree found in the E. Indies and Arabia, and known as the horse-radish tree (*moringa* [illegible] exposed t [illegible] a whitish, being removed, is unaffected by cold, on which account it is of great value to watchmakers. B. O. is also used by painters [illegible] extract the [illegible] pure it will [illegible] ness, but, owing to its frequent adulteration with inferior oils, its use is limited.

Benadir, the name applied to the coastal dist. in the S. of It. Somaliland, containing Brava, Marka, Warsheik, and Yub, the ports of the protectorate.

Benalla, a township of the Delalite co. of Victoria, Australia, 43 m. S.W. by W. of Beechworth. Pop. over 3000.

Benares, a tn. in dist. of B. in the *United Provinces of India, is one of* the most anct. cities of the world, and is the holy city of the Hindus. Ruins, situated 3¼ m. to the N. of the city, indicate that here was the original site. In the 6th century Sakya Muni, a Buddhist, estab. his religion there, a fact which testifies to the status of the city even at that time. Its modern temples number about 1500. It has sustained little loss of beauty, as its appearance from the R. Ganges is one of the sights of India. Numbers of bathers are observed [illegible] away their sins in the [illegible] riv. The tn. is surroun[illegible] called the 'Panch-kos' road, from its length of five kos (7½ m.). Sacred rites are observed in connection with it, and tho[illegible] verse it in the bo[illegible] iring entrance to [illegible] The European [illegible] the W., and co[illegible] and the Centra[illegible] chief manufs. are silks, gold and silver thread, filigree work, and embossed brass ware. Pop. (1901) 209,331. The dist. of B. has an area of 1008 sq. m., and is a level tract watered by the Ganges, Karamnasa, Gumti, and Burna. It yields barley, rice, wheat, sugar, and opium. Its climate is cool in winter, but hot to an extreme degree in the summer. Famines occur occasionally.

Benavente, an anct. ruined tn. of Spain, standing on the R. Esla in the Zamora prov. Silk spinning is the industry. Pop. 4536.

Benbecula, an is. of the Hebrides, lying between N. and S. Uist, and about 20 m. W. of Skye. It belongs to Inverness-shire. Its area is about 36 sq. m. Three-quarters of the land is taken up by farmers. Pop. 1425.

Benbow, John (*1650-1702*), vice-admiral, spent his whole life in active service at sea. Near Jamaica he attacked a Fr. squadron far superior in numbers to his own; his leg was broken by a shot, but he sat on deck to take charge of the attack; he was defeated owing to the want of support from other officers; he returned to Jamaica, the officers were punished, and he died of his wounds.

Bencher, *see* INNS OF COURT.

Bench-warrant, an order issued by the court to enforce obedience, as in the case of delinquent jurymen, for contempt of court. These warrants are used extensively in the States.

Bencoolen, the cap. of the residency of B., Sumatra. It is situated on the S.W. coast of the is. The Eng. settled there in 1685, and estab. an extensive trade. Subsequently they ceded it to the Dutch in 1825. Its pop. is 6000. The residency covers an area of 9690 sq. m., and has a pop. of 140,126.

Ben Cruachan, a mt. 3689 ft. high, in Argyllshire, Scotland, just N. of Loch Awe.

Benczur, Gyula (*b.* 1844), a Hungarian painter, born at Nyiregyháza. He studied at the Academy of Munich, to which he was appointed professor, 1876-83. He became director of the Academy of Budapest in 1883. B. has been greatly influenced by his master, Karl Piloty, but, nevertheless, his work shows [illegible] originality of thought, and his [illegible] and execution are very fine. [illegible] noteworthy paintings are: 'Arrest of Rákóczy in 1701,' 1869; 'Family of Louis XVI. during the Assault on Versailles,' 1872; 'Bacchanti,' 1881; and portraits of Count Syapari, 1886; Count and Countess Karolyi, 1887; and Ferdinand I. of Bulgaria, 1894.

Bend (in heraldry) **Bande,** or **Baleum,** is one of the group of figures

called ordinaries, which are the earliest devices of mediæval heraldry, being nine in number, and simple in character. A B. is formed by two parallel lines drawn diagonally, and at equal distances from the fesse-point, from the dexter chief to the sinister base; the fesse-point being the centre of the escutcheon. It is in width one-third of the shield if charged, and one-fifth if uncharged. When the width of the B. is reduced by half it is called a 'bendlet.' When a bendlet is halved, it is termed a 'cotise.' A B., placed between two cotises, is said to be 'cotised.'

A 'riband' is a cotise couped, that is to say, cut off smooth at its extremities, so that it does not extend to the edges of the shield. The riband is used to mark a difference, and is sometimes cut short, when it becomes a 'bâton' and is the Fr. *barre*. The bâton often marks illegitimacy. The term bâton, however, is also used for the riband. The 'scarp' is half the B., and the bâton a quarter of the B. In the case of the B. being reversed, that is, sloping from the sinister chief to the dexter base, it is termed the 'B. sinister.' When charges are placed towards the B., they are spoken of as 'bendwise,' and all charges are understood to be so placed. When sev. charges are so placed with reference to each other that they run from dexter chief to sinister base they are said to be 'in B.' 'Per B.' is when the field or charge is equally divided by a line drawn diagonally from dexter chief to sinister base. 'Bendy' is the term used to mean a field divided into four, or a greater even number of parts, by lines drawn diagonally, or in the direction of a B.

Benda, Georg (1721-95), a distinguished composer, was born at Jungbunzlau in Bohemia. He was one of a noted musical family. He was also a pianist, violinist, and a musical director at Berlin in 1740, Gotha in 1748, and Hamburg in 1778, and again at Gotha after 1766. He composed operas and cantatas. He died at Kostritz.

Bendall, Cecil (1856-96), English Orientalist. In 1882 he was appointed assistant manager of the Oriental library dept. at the British Museum, and in 1885 he was appointed to the chair of Sanskrit in University College, London. He issued a *Catalogue of Buddhist Sanscrit MSS. in the University Library, Cambridge*, 1883. He also wrote *A Journey of Literary and Archæological Research in Nepal and Northern India*, 1886; and *Cikshasamuccaya*, 1897.

Bendemann, Edouard (1811-89), a famous Ger. painter. He was born at Berlin. His master was the celebrated artist, Schadow, whose daughter he married later. He was a little more than twenty years of age when his artistic genius was first recognised by his own countrymen. In 1832 he produced his great picture of the 'Captive Jews' at Berlin. His fame spread, and in 1837 he was awarded the gold medal at Paris. In 1838 he was appointed to the professorship at the Academy of Art in Dresden. While here he was entrusted with the decoration of the frescoes in the throne-room at the palace, and on these depended the establishment of his fame. His picture, 'Jeremiah in the ruins of Jerusalem,' which he painted for the King of Prussia, was a great success, although the colouring was not altogether satisfactory. His paintings were correct and elegant, but were somewhat lacking in passion and force. In 1858 he succeeded his former master, Schadow, in the directorship of the Dusseldorf Academy, and he continued to hold this position until 1867. His works were chiefly religious, allegorical, and historical. He also produced several very large canvases and frescoes.

Bendemir, Bendemeer, Bendamur, or **Bundameer**, is a river of Persia, which flows into Lake Tashk or Nargis to the east of Shiraz.

Bender (Bendery), a Russian tn. of the gov. of Bessarabia. It is situated on the r. b. of the Dniester. Tobacco, candles, and bricks are produced, while it exports corn, wine, wool, and cattle. Timber is floated down the Dniester. The tn. dates back to the 12th century. Pop. (1900) 33,741.

Bender-Abbas, which means 'harbour of Abbas,' from the Shah Abbas I., is a tn. on the N. shore of the Persian Gulf, belonging to the Kirman prov. in Persia. It is 12 m. N.W. of the is. of Ormuz. It has port accommodation, and good anchorage for large vessels in 4-5 fathoms, about 2 m. off tn. Its trade is comparatively small. The exports are cotton, tobacco, drugs, dyes, opium, dried fruits, carpets, woollen and silk goods. The imports are dry goods, sugar, spices, glassware, and hardware. Under the name of Gombroon, it at one time took its place among the first seaports of Persia. The tn. is surrounded by walls, but the interior is of very poor description. The Eng. were allowed to build a factory in 1620, and the Dutch soon after received the same permission. The old Dutch factory still stands. Pop. 8000.

Bender-i-Gez, or **Bandar-i-Gez**, an important port on the Caspian, Persia. Its chief exports are raw cotton, almonds, dates, raisins, wheat,

wool. Its chief imports are glass, grain, and manufactured goods.

Bendigo, otherwise Sandhurst, is a tn. and co. in Victoria, Australia. The co. has for its western boundary the R. Loddon, and the Campaspe on the E. Its area is about 1949 sq. m. The town is noted for its gold and quartz mining. Rich deposits of gold were found in 1851. It is also noted for its agric. produce and wines. It is on the main line of railway between Melbourne and Echuca, 100 m. N.N.W. from Melbourne. Pop. 44,510.

Bendzin, a tn. in the prov. of Poiterkow, Poland. It is one of the chief coal mining centres of S.W. Poland.

Benedek, Ludwig (1804-81), a famous Austrian general, was born at Odenburg, Hungary. He was a doctor's son. He started his career in the army in 1822. In 1846 he took part in the suppression of the Polish peasants at Galicia, and then began to distinguish himself. In 1847 he had command given him of a regiment in Italy, and again received command during the Hungarian campaign of 1849. Then he returned to Italy. He repelled the Piedmontese at Solferino, and won for himself still greater fame. In 1860 he became governor of Hungary. Six years later, 1866, he had command of the Northern Austrian army in the war with Prussia. He was completely defeated at Sadowa, and was suspended, a court-martial being ordered. This latter was dropped by the emperor's command. B. retired to Graz, where he died.

Beneden, Pierre Joseph van (1809-94), Belgian zoologist and naturalist, was appointed head of the Louvain Natural History Museum in 1831. In 1835 he became a professor at the university of Ghent, and in the next year at the Catholic University, Louvain. In 1881 he was appointed president of the Academy of Sciences. Among his most notable works are *Zoölogie Médicale* (in collaboration with Gervais): *Ostéographie des Cétacés vivants et fossiles*, 1868; and *La Vie Animale et ses Mystères*, 1863.

Benedetti, Vincent, Count (1817-1900), a Fr. statesman, born at Baslia in Corsica. At twenty-three years of age he entered the foreign office. Five years later, in 1845, he was appointed consul in Egypt, and in 1848 consul at Palermo. In 1864 he was ambassador at Berlin. He drafted a secret treaty between France and Prussia, which was made public when war broke out in 1870. For this he was severely criticised, and he retired to Corsica. His defence was confirmed before his death, which occurred at Paris.

Benedicite. This is the canticle or hymn, beginning in Lat. 'Benedicite *omnia opera Domine*,' and in Eng., 'O all ye works of the Lord, bless ye the Lord.' It is very like the 148th psalm, and is probably an enlargement of it. It occurs in the Gk. and Lat. Bible in the third chapter of Daniel, under the title of 'The Song of the Three Children.' It is said to have been sung by the three young Jews, Shadrach, Meshach, and Abednego in the burning fiery furnace. This hymn formed part of the Christian service from the time of St. Chrysostom, and is still used in the Anglican Church.

Benedict, the name assumed by fourteen popes and one anti-pope. Of the earlier occupants of the papal chair who bore this name, little is known of importance concerning them. The following list gives the date of their accession and death. B. I., 573-8; B. II., 684-5; B. III., 855-8; B. IV., 900-3; B. V., 964-5; B. VI., 972-4; B. VII., 974-83.

Benedict VIII. (1012-24). In the early days of his pontificate he was opposed by an anti-pope, Gregory, but was reinstated by the Emperor Henry II. In his days, the Saracens began their attacks upon the southern coast of Europe, and the same age also witnessed the beginning of the Italian settlements of the Normans. The pope was noted for his disciplinary policy, and opposed and forbade the marriage of priests.

Benedict IX., the nephew of the preceeding pope, who obtained succession of the papal chair at the age of twelve, in 1033. The unexampled licentiousness which corrupted his court, although tolerated by the emperor, caused the Romans to revolt and drive him out. He was replaced by a pope, Silvester, and later still another pope was elected in the person of one Gregory. Henry III., the emperor, caused all three to be

deposed them by a pope,

two years later

seized the papal

chair, but was again driven forth by the Romans. He died probably in the year 1056.

Benedict X. (1058-59). Elevated by the Roman barons, he was opposed by the great Hildebrand, who caused another pope to be elected, and who finally deposed and degraded Benedict.

Benedict XI. (1303-4). Was unanimously elected, but was faced by great difficulties, the legacy of his predecessor, Boniface VIII. He died in the year after his election, probably poisoned by Nogaret, whom he had excommunicated.

Benedict XII., nephew of John XXII., whom he succeeded in 1334. Although elected by the influence

of nepotism, he strenuously opposed nepotism during his tenure of office. He reformed the monastic orders, and died in 1342.

Benedict XIII., a title held by two popes, Pedro de Luna, an anti-pope (*see* below), and Francesco Orsini, who became pope in 1724. A great theologian and philosopher, who wrote a number of works which were published after his death. He meddled but little in political matters, and his attempts at reforms, whilst good in themselves, were failures. He died in 1730.

Benedict XIV., a learned and distinguished occupant of the papal chair. Previous to his election to the papacy he had been recognised as one of the leading members of the Church. He did something to reform the papal states, but his reforms were not sweeping enough. He attempted also to reform the missionary methods of the Jesuits in S. America, India, and China. During the whole of his pontificate he continued his studies, and also had a number of scholars at his court. He was learned, enlightened, and tolerant. He died in May 1758.

Benedict XIII. (Pedro de Luna, *see* above), a learned and distinguished member of one of the most noble Spanish families. He was elected anti-pope by the French cardinals at Avignon in 1391. It was expected that after his election he would end the schism by voluntary abdication, but by his firmness and his belief in his own cause he prolonged it for thirty years. Abandoned by the cardinals who had elected him, recognised nowhere save in Spain and Scotland, at times in fear of his life, he remained anti-pope until his death in 1423.

Benedict, Saint (480?–543), the founder of the order of Benedictine monks, born at Nursia in Italy was educated at Rome, but at the age of fourteen removed to Sublaco, a desert place 40 m. distant, and concealed himself in a cavern. The monks of a neighbouring monastery chose him for their abbot, but their manners did not suit him, and he retired to solitude again; many followed him and put themselves under his direction: in a short time he founded twelve monasteries. He converted (in 528), the people at Monte Cassino from idolatry; here he founded other monasteries, and composed his *Regula Monachorum, or Rules for Monks*, which did not receive papal sanction until fifty-two years after his death.

Benedict, Sir Julius (1804–85), a composer and musician, born at Stuttgart. His father was a Jewish banker. His studies, under Hummel, took place at Weimar, and under Weber at Dresden. In 1825 he was appointed director of the Ger. opera at Vienna. In 1836 he came to spend the rest of his life in London. He was conductor of the Eng. opera at Drury Lane at the time of Balfe's popularity. In 1838 he composed the *Gipsy's Warning*, *The Bride of Venice* in 1843, and *The Crusaders* in 1846. In 1850 he went to America in company with Jenny Lind on her oratorio tour. One of his most successful operas is the *Lily of Killarney*. He ranks amongst the most capable of Ger. musical composers. He was created a knight in 1871, and died in London.

Benedict Biscop (628?–690), Eng. monk and ecclesiastic, was born of a noble Northumbrian family, his surname probably being Baducing. During his early life he was a courtier at the court of King Oswiu. After two journeys to Rome (he later made several more) he became a monk at Lerins. In 669 he escorted Theodore of Tarsus to Canterbury, and was at the same time made abbot of St. Peter's Monastery at that place. Some years later he made his third journey to Rome and returned with a vast store of books, manuscripts, etc. He built and endowed with these a monastery at Wearmouth, on land given him by King Ecgfrith of Northumbria. In 682 he erected a dependent house at Jarrow. It is impossible to estimate his huge services to Eng. literature and culture. He was the pioneer of Saxon architecture, and gave impetus and opportunity to all the arts.

Benedictine, *see* LIQUEUR.

Benedictine Order. The exact year when the monks who followed the rule of St. Benedict were first estab. as an order is unknown, but it made great progress: there were nuns of this order as well as monks. It was first introduced to England by St. Augustine. All our cathedral priories were of this order, and most of the richest abbeys in England. Tanner (*Notit. Monast.*) enumerates altogether 186 establishments in England whose revenues amounted to £65,877 14*s.*

Benediction (from Lat. *benedico*, to bless). It implies usually the conferring of a blessing, or an earnest wish for the welfare of a person or project. In the Catholic Church there is the sacerdotal B., which is performed only by the priest. In this acceptation of the function, only the power of the priests to resist evil forces is included, while in the vague interpretation of it by Christian churches any hope strengthened by prayer is understood to deserve the name. Originally the B. was particularly resorted to in exorcism of evil spirits, but the modern enlightened

mind, recognising as devils different spirits from those dreaded by our forefathers, widens this view very considerably in order completely to meet the greater significance. The Roman Catholic rite is performed generally by the priest barefooted and with uncovered head, and during the prayer holy water is sprinkled. Of these functions the B. of the Blessed Sacrament is the most popular. Among reformed churches the term is applied to the words used by the preacher in dismissing his congregation.

Benedictus (Lat. *bene*, well, and *dico*, to say), a song of thanksgiving composed by Zacharias, at the circumcision of his son John the Baptist It commences in Lat. with 'B. qui venit in nomine Domini,' and in Eng. 'Blessed is He that cometh in the name of the Lord.' It has occurred since the 9th century in the service of the Christian church.

Benedix, Julius Roderick (1811-73), a Ger. author and dramatist, was born at Leipzig. He was in succession a tenor, a journalist, a lecturer, and a stage manager. In none of these spheres, however, was his fame to be estab., though his great versatility won for him extreme popularity. He was gifted with a vivid imagination which was particularly evident in his *dramatic works, and a fund of* humour that was prominently displayed in his comedies. These latter endeared him to his fellow countrymen, and made his name famous. They abound in witty dialogue, and humorous intricate plot, with a *continual variety of scene and incident.*

His dramatic works are numerous. Twenty-seven vols. have been collected at Leipzig. Several, such as *Tête Moussue*, have obtained great success. His literary works, apart from comedy and drama, are: *Popular German Stories, pub. in 1839-40;* '1813, 1814, 1815,' a book which presents scenes from the wars against Napoleon I., and *Scenes from Lives of Comedians*, which was pub. in 1847. He died at Leipzig.

Benefi [illegible] first used in [illegible] in land. T [illegible]m- ployed by the Lombards and in the laws of Charlemagne's constitutions. These lands were generally won by distinction in war, and were given as incentives to greater martial prowess. Later the lands became *grants of a* hereditary feudal nature. To-day the word implies any variety of church dignity, and in particular, those of rectories and vicarages which are Bs. with the cure of souls (hence curacy), these differing from bishoprics and cathedral dignitaries. *Exempt, or as* they are sometimes called, peculiar Bs., are those not under the jurisdiction of a bishop, though regarding residence they are under episcopal administration. The holding of a B. is dependent upon four conditions. Of these the first is Holy Orders; the second is Presentation, *i.e.* the formal donation of the B. by the patron; the third is Institution, at which ceremony responsibility for the cure of souls is formally committed to the clergyman by the bishop; fourthly, there is Induction, the ceremony of giving the clergyman possession of the temporalities. The work involved in the holding of a B. entails public worship, baptism, marriage, burial, the ceremony of the Lord's Supper, and the vaguer duties of visits and communion with the parishioners. The properties connected with a rectory are the freehold of the house, the glebe, and tithes. A vicar, as distinct from a rector, does not enjoy all of these emoluments, being entitled generally only to a portion of the ecclesiastical dues of a particular parish. But a vicar is entitled to reside in the rectory house. In Scotland Bs. are divided into temporalities and spiritualities, *i.e.* lands and teinds. The Patronage Act of 1874 regulates the election of its ministers. The Scottish minister has *not the same rights in the church and* churchyard as those held by ministers in England. His emoluments consist of the glebe and manse.

Beneficiary, in the law of both England and Scotland, a term used to denote any person who is in the *enjoyment of, or is entitled to, any* interest or estate held in trust by other persons. It is often doubtful in the case of charitable bequests who the Bs. really are, and the courts or commissioners occasionally, as a result of their inquiries, reform the *charity, and so change the class of* Bs. The trustees are liable to give an account of their actions to the Bs., and an interdict or injunction may be issued against them by the latter if they make a wrongful use of their funds.

***Benefit of Clergy**, a term used in* connection with a previous condition of English law. It demonstrates the power of the clergy and the ignorance of the people. Briefly, the benefit meant an exemption of clericals from the authority of secular magistrates *respecting crimes and misdemeanours.* The entire control over a priest was vested in the bishop. Later the corrupt state of things was modified, though a priest could still resume holy orders after conviction. Still later the privilege was extended to all *persons who were able to read.* This immoral law was finally abolished,

after many purposeless modifications, in the reign of George IV. In Scotland the benefit was never recognised.

Benefit Societies, *see* FRIENDLY SOCIETIES.

Beneke, Friedrich Eduard, a Ger. psychologist, was born at Berlin, 1798. He studied philosophy and theology at Halle and Berlin. He commenced his public life as a lecturer in 1820, and at that time pub. sev. pamphlets. His views were so directly opposed to the popular favour that he was for a time forbidden to express them in public. For three or four years he lived at Göttingen, earning a livelihood by teaching. In 1827 he was once more allowed to resume his lectures at Berlin. He pub. many books on metaphysics and ethics, also large treatises upon philosophy. His two books, *Theory of Knowledge* and *Foundation of all Knowledge*, are well known. In 1854 he suddenly disappeared; two years later his body was discovered in the canal at Charlottenburg.

Beneschau, a tn. of Bohemia, Austria, 18 m. S.S.E. of Budweis. Pop. 7000.

Benevento, a tn. of Campania, Italy. It is the cap. of B. prov., and is situated on a hill of 400 ft., at the confluence of the Calore and Sabatto. Its population in 1901 was 17,227, while that of the commune was 24,137. Originally the old town of Beneventum stood on its site, a tn. which is reputed to owe its foundation to Diomedes. The Romans defeated the Samnites in 314 B.C., who found shelter at Beneventum. During their final campaign of 275 B.C. the tn. was used by the Romans as a centre of their military activities. In 268 B.C. a Latin colony was founded there. Hitherto the tn. had borne the name of Maleventum, but now it assumed the above name, which was given it on account of the significance of its meaning. Antique remains testify to its importance, of which the most imposing is a triumphal arch erected to Trajan by the senate. The tn. became the residence of a powerful Lombard duchy and remained in a state of independence till 1053, when it was ceded to Leo IX. It was united to Italy in 1860, after having returned to the papacy in 1815. The tn. is subject to earthquake visitations, and considerable damage has been done. The prov. is 834 sq. m. in extent. The prin. industries are the manuf. of leather, parchment, and plated ware.

Benevolence, a type of compulsory loan exacted by kings who dispensed with legal justification. It originated in 1473 with Edward IV., though like contributions had been levied in previous reigns. They were not officially called Bs., however. They were voted 'unlawful' in the reign of Richard III. in 1484, yet Richard often employed this illicit mode of enriching himself, as did Henry II. James I. attempted its adoption, though without material success. Bs. were rendered illegal both by the Petition of Right, 1628, and by the Bill of Rights, 1689.

Benfeld, a tn. situated on the R. Ill, in Alsace-Lorraine, Germany, in a dist. of great fertility. Its chief productions are tobacco, hops, and hemp. It was besieged by Count Ulrich of Würtemberg, 1331, and by the Armagnacs, 1444. It was ceded to Sweden in 1632, but it came into the hands of the Gers. by the treaty of Frankfort.

Benfey, Theodor (1809-81), a Ger. philologist of Jewish parentage, born at Nörten, near Göttingen. He was intended to enter the medical profession, but he preferred literature. He studied at Göttingen, Heidelberg, and Munich, and afterwards settled in Frankfort as a teacher. He pub. many manuals and translations, and in 1866 he sent forth his great work, the Sanskrit-English dictionary. All his works were produced under stress of great poverty. As a result of his unflagging labours for a period of over half a century, Sanscrit philology owes more to him than to almost any other scholar. His death occurred at Göttingen.

Bengal, a prov. of British India. Its boundaries are: on the N., Nepal and Sikkim; on the E., Eastern B. and Assam; on the S., the Bay of B. and Madras; and on the W., the Central and United Provinces. Its area is 141,580 sq. m., and its pop. 54,096,806. Within its limits are the provs. of Behar, Orissa, and Chota Nagpur, and the W. portion of the valley of the Ganges. This area is divided into six British divs., Bhagalpur, Patna, Burdwan, Chota Nagpur, and Orissa. In all there are thirty-three British dists. in the prov., named respectively, Burdwan, Birbhum, Bankura, Midnapore, Hugli, Howrah, Twenty-four Parganas, Calcutta, Nadia, Murshidabad, Jessore, Khulna, Backergunge, Faridpur, Patna, Gaya, Shahabad, Saran, Champaran, Muzaffarpur, Darbhanga, Monghyr, Bhagalpur, Santal Parganas, Purnea, Maldah, Darjeeling, Jalpaiguri, Rangpur, Dinajpur, Bogra, Pabna, Malda, Cuttack, Puri, Balasore, Singhbhum, Manbhum, Ranchi, Hazaribagh, Palamau, and Lohardaga. The native states of Orissa and Chota Nagpur, with the native Sikkim states and Cooch Behar, are under the control of the Lieutenant-Governor of B. Geographically, B. is divided into B. proper, Behar, Orissa, and Chota Nagpur. The first three consist of large river valleys, while the last, Chota Nagpur, is a mountainous dist. The Ganges valley forms the northern portion of B. proper, and is one of the most richly endowed, and hence most

thickly populated, regions of the world. Natural productions are extraordinarily abundant, and comprise tea, indigo, turmeric, lac, opium-poppy, grain, pepper, ginger, quinine, spices and drugs, oil-seeds, cotton, mulberry, jute, timber, all in marvellous profusion. Every conceivable material necessary for human subsistence is to be found. The huge waters of the Ganges naturally result in the large tracts of alluvial deposit at its mouth. The climate is varied. In the Himalayas snow is found all the year round, while in Behar scorching winds and natural vapour baths are climatic features. The thermometer registers a range of temp. between 52° F. and 103° F. The rainfall fluctuates between 65 in. in the delta and 37 in. in Behar. The rivers are Ganges, Sone, Gogra, Gandak, Kusi, Tista, Hugli, Damodar, and Mahanadi. The annual floods of the Ganges delta prepare the soil for the cultivation of rice, and the remarkable sight is often seen of rice-fields covered in considerable depths of water. The courses of the various streams are continually changing their direction, hence a man's property is diminished or augmented at different times. The chief mineral is coal, and its production rivals that of the gold of Mysore in value. The most valuable mine is at Raniganji, and is 500 sq. m. in area. Calcutta is the centre of the sea trade of B., whose principal exports include jute, tea, hides, opium, rice, oil-seeds, indigo, and lac. Adequate railway communication is estab., of which the E. India is the greatest B. is by Indian and general enlightenment. It has 2500 secondary schools, over 50,000 elementary institutions, and numerous university colleges. The Mohammedan conquest of B. took place at the beginning of the 13th century. Four centuries later the East India Company made its first settlement and formed the nucleus of the British empire of India. The rights of proprietors and cultivators were assured and protected by the Permanent Settlement of the Land Revenue and the Tenancy Acts respectively.

Bengal, Bay of, is a part of the Indian Ocean. It stretches between India and further India, washing the whole of the eastern side of the country. It is visited by the monsoons, which prevail over the whole area of the ocean. Many large rivers empty themselves into the bay—the Ganges, and Brahmaputra from the N., while from the E. it receives the Irawadi, and from the W. the Mahanade and Godavery. There are many good ports on the E., but few, if any, on the W. The Andaman and Nicobar are the chief groups of is., which are very numerous.

Bengal Gram (*Cicer arietinum*), or chick pea, a leguminous plant grown largely in India and in Egypt. The seeds are eaten raw or cooked, or ground into flour for cakes. The leaves and stems exude a moisture containing oxalic acid, which is used medicinally.

Bengal Hemp (*Cannabis Indica*) is used in sev. forms; the dried leaves and stalks, called *bhang,* are (1) smoked with or without tobacco, (2) made into a sweetmeat with honey, (3) or into the intoxicating compound called *hashish.* The best hashish, however, is made from the flowering and fruiting heads (*ganja*). The resin of the plant is called *charas.*

Bengali Language, one of the forms of speech comprising the eastern group of the Indo-Aryan tongues. It resembles Oriya and Assamese, since all three are derived from the same source. They are immediately descended from the Māgādhi Prakrit, and the centre of that language was Behar. Bengali has two main dialects, of which the western is the more pure. The oldest writer of Bengali is the poet Candi Dās, a Vaishnava. A school of poets was founded by him, who wrote hymns to Krishna.

Bengal Lights, or blue light, as it is called, is a vivid signal light used at sea. It is a composition of nitre, sulphur, and black sulphide of antimony, ground to a powder, dried, and mixed, by weight, in the proportion: nitre 6, sulphur 2, and black sulphide of antimony 1. When this is lighted, a most brilliant blue light which illuminates the sea for many miles around is the result. The B. light is used in cases of shipwreck. Owing to the poisonous fumes from it the light cannot be used safely in enclosed spaces.

Bengazi, a seaport of the N. coast of Africa. It is the cap. of the sanjak of Barca (Bengazi). Its situation is a narrow strip of land between the Gulf of Sidra and a salt marshy tract. Vessels of light draught only are able to enter the harbour, which is spoiled by silt. The tn. exports barley, while its former trade in Sudan products now travels via Tripoli. Of all the Ottoman possessions B. was the least enlightened. Its pop. is about 25,000.

Bengel, Johann Albrecht (1687-1752), scholar and theological writer, born at Winnenden, near Stuttgart. In 1703 he entered the theological college at Tübingen. Later he became prelate at Würtemberg. He pub. an excellent ed. of the Greek Testament, and his theological works were much esteemed by John Wesley.

Benger, Elizabeth Ogilvie (1778-1827), a biographical writer, now forgotten, whose poverty was such that when a girl she used to go and read the open pages displayed in the booksellers' windows, hoping from day to day that the page might be turned over; this was in Wells, and in 1802 she came to London, where she met many literary ladies, such as Miss Aikin, Mrs. Barbauld, Miss Joanna Baillie; her reputation was estab. by her literary biographies.

Benguela, or Benguella, a tn. in Portuguese W. Africa. It is situated on B. Bay, and is the cap. of the dist. of that name. Its trade, once important, particularly in slaves, has since rapidly lessened. Its white pop. numbers 1500.

Benguet, a fertile prov. of the Philippine Is. Rice is grown and tropical fruits. The United States have also introduced grapes, figs, blackberries, and strawberries into the province with successful results. Coffee is also grown in the prov., and of a very fine quality.

Benhadad, the name of two (or, according to some, three) kings of Damascus. B. I., son of Tabrimmon, was an energetic fighter. He besieged Ahab of Israel in Samaria (2 Kings vi.), and long opposed Shalmaneser, the Assyrian king. His death took place between 846 and 842 B.C. (*see* 2 Kings viii. 7-15. In his youth B. had been an ally of Asa, king of Judah, but some hold that the ally of Asa was another king of the same name. B. II., son of Hazael, and probably the grandson of B. I. He was thrice defeated by Joash, king of Israel (2 Kings xiii. 25). More probably Mari, and not B. is the correct name of this king, as Rammannirari III. mentions a king of Damascus called Mari whom he besieged at Damascus. B., like his father, grievously oppressed Israel.

Benham, William (1831-1910), Eng. theologian, was tutor at St. Mark's College, Chelsea, 1857-64; professor of history at Queen's College, London, 1864-73; and rector of St. Edmund's, London, in 1882. He was made an hon. canon of Canterbury in 1885. He trans. Thomas à Kempis' *Imitation of Christ*, 1874, and brought out an ed. of Cowper's Letters in 1883. His best known works are: *A Short History of the Episcopal Church in America*, 1884; *A Dictionary of Religion*, 1887; and (in collaboration with another) *Life of Archbishop Tait*, 1891. He was also chief editor of the Ancient and Modern Library of Theological Literature.

Beni, the plural of the Arabic word 'Ebn' or 'Ibn,' a son. It occurs in Eastern geography as a component part of many names of families or tribes, as Beni Temim, the sons of Temim, or the Temimides.

Beni, a riv. in S. America, Bolivia. It rises in the Andes, and has a course of about 1000 m. Its current is very strong, so it is not navigable. It is used for the canoes of the bark-gatherers and india-rubber collectors.

Beni, a dept. of Bolivia, S. America, with a good climate and fertile soil, yet little known and thinly populated. Trinidad is the chief tn. Pop. 29,000.

Benicarlo, a seaport of Spain, in Castellon. It manufs. a red wine of considerable strength, and also brandy. The wine is exported chiefly to Bordeaux, where it is mixed with lighter wine for table use. Pop. 7000.

Benicia, a seaport and banking city in Solano co., California, on the Strait of Carquinez, about 25 m. by water N.E. of San Francisco with which it is connected by the S. Pacific Railway. It has extensive wharves, shipyards, a United States arsenal, and barracks.

Beni-Hassan-el-Quadym, or Old Beni-Hassan, a vil. of Middle Egypt, situated near the E. bank of the Nile. In the neighbourhood are catacombs of considerable extent.

Beni-Israel ('Sons of Israel'), a colony of Jewish descent settled on the Malabar coast, Bombay presidency, India. Although they acknowledge the Mosaic laws and have traditions which suggest an ancient Judaic invasion of India, they repudiate the name of Jews. According to some authorities, the B.-I. settlement in India dates no farther back than the 15th century, while it is supposed by others to be a remnant of the ten tribes. They are clearly distinct from those Jews who in modern times have gone to India for trading purposes. The colony numbers about 5000.

Benin, a country of British W. Africa and part of Southern Nigeria. Its area was at one time very extensive, but the gradual securing of independence by small tribes occupying some of its states, has considerably lessened it. The characteristics of B., climatic, botanic, and zoologic, resemble those of S. Nigeria. It has a very low coast-line, interrupted by numerous creeks and forming a large swamp covered with mangroves. The name B. also embraces a city and riv. in the same locality. Its inhab. are pure negroes. The tn. is situated on Gwato Creek, and exports palm oil via Gwato, 30 m. distant. Coral exists in abundance.

Benin, Bight of, in the Gulf of Guinea, between Capes Formosa and St. Paul. It consists of a continuous line of low, marshy, sandy shore, intersected by numerous rivers and estuaries more especially towards

Cape Formosa, where they form alluvial islands, which are part of the delta of the Niger.

Benin River, a riv. of W. Africa, which flows into the Atlantic after a course of 70 m. It forms the western boundary of the Oils R. Protectorate.

Beni Saf, a seaport, with harbour of 26·2 ft. depth, in Algeria, 30 m. N. of Tlemçen, in the prov. of Oran. It exports considerable quantities of iron ore found in the district.

Beni-Suef, a tn. and prov. in Central Egypt. The tn. is on the W. bank of the Nile, 63 m. S.S.W. of Cairo, and is the entrepôt for the produce of the prov. of Fayoum. It has a large cotton factory and alabaster quarries. *Pop.* (1897) 18,229.

Benjamin, the youngest son of Jacob and Rachel. His mother, who died at his birth, gave him the name of 'Son of my sorrow' (Ben-ōni), but Jacob altered it to its present meaning, 'Son of my right hand' (or prosperity). He gave his name to a tribe of Israel.

Benjamin, a tribe of Israel, named from the youngest son of Jacob and Rachel. When the tribe entered Palestine it was given an area bounded by Ephraim, Dan, and Judah. The numbers of the tribe sunk to a low ebb during the control of the Judges, but increased again by means of an addition of 400 virgins who were captured from Shiloh. In spite of the circumstance that its ter. lay to the W. and E., it was physically united with Judah, and it owed its increasing importance to its position between Judah and Ephraim. It is called 'the least of the tribes,' yet it has a great antique value regarding its place in the history of the O.T., as is determined by the royal sanctuary at Bethel, the position of Jerusalem as the centre of religious adoration, and its associations with the history of Samuel.

Benjamin, Judah Philip (1811-84), *eminent American lawyer and politician, born at St. Croix, W. Indies.* He was made counsellor of the supreme court in 1848, and from 1853-61 represented Louisiania in the senate of the United States. In the latter year he withdrew from the senate to become attorney-general in [illegible] provisional gov. of [illegible]cy, being subsecretary of war, 1861-62, and chief secretary of state, 1862-65. After the surrender of the Confederates, B. escaped to England, and, entering Lincoln's Inn, was called to the bar in June 1866. He practised on the northern circuit, and in 1872 was made queen's counsel. Owing to ill-health he retired to live in Paris in 1882, where he died.

Benjamin of Tudela, a Jewish rabbi, and author of the *Itinerary,* the son of Jonas of Tudela, was born in the kingdom of Navarre. He travelled from Constantinople through Alexandria in Egypt and Persia to the frontiers of China. Sasius, who follows Wolfuns's *Bibliotheca Hebraica,* places the date of Rabbi B's. travels about 1160. They ended in the year in which he died, A.D. 1173. B.'s principal view seems to have been to represent the number and state of his brethren in different parts of the world. It has been translated into most European languages.

Benjamin Tree, or *Styrax benzoin,* a native of Sumatra and Java, belongs to the order Styracaceæ. It yields "[illegible]lled gum-benzo which is used [illegible]nauf. of incense and in perfumery.

Benkovac, a tn. in Dalmatia, Austria, about 20 m. S.E. of Zara; pop. (1900) 14,197.

Ben Lawers, a mt. in Perthshire, Scotland, about 32 m. W.N.W. of Perth, on the N.W. side of Loch Tay. Commands a very fine view. Height 3985 feet.

Ben Ledi (Gaelic for 'the hill of God'), a mt. in Perthshire, Scotland, 5 m. N.W. of Callander. Height 2875 feet.

Ben Lomond, a mt. in Stirlingshire, Scotland, E. of Loch Lomond, and about 26 m. N.W. of Glasgow. An exten[illegible]ined from the N. si[illegible]ft. Height 3192 feet.

Ben Macdhui, or **Muichdui** (Gaelic 'mt. of the black pig'), a mt. in Aberdeenshire, on the border of Banffshire. The second highest mt. in Great Britain, its elevation being 4296 ft. Its summit is flat and bare.

Ben More, *a mt., 3843 ft. high,* in Perthshire, Scotland.

Benmore Head, a basaltic rock and [illegible] Ireland. or tect[illegible]ceeds of [illegible]sed in [illegible]ication, [illegible]vourite [illegible]nixture

Bennett, Enoch Arnold, English novelist and playwright. Born in N. Staffordshire, 1867, and educated at Newcastle Middle School. Commenced to study law, but abandoned it in 1893 for journalism. Many of his novels deal with the pottery towns, and these are among his best books. Perhaps his best novel is *The Old Wives' Tale,* 1908. Other later novels are: *Clayhanger,* 1910; *The Card,* 1911; and *Hilda Lessways,* 1911, this latter

being a sequel to *Clayhanger*. Among his plays are: *Cupid and Commonsense*, 1908; *What the Public Wants*, 1909; *The Honeymoon*, 1911; and (with E. Knoblaugh) *Milestones*, 1912. Resides much in France, and is proud of having written a piece of personal autobiography, *The Truth about an Author*, in which the 'business' side of literature is set forth.

Bennett, James Gordon (1795-1872), an eminent American journalist, founder and editor of the *New York Herald*, was born at New Mill, Banffshire, in Scotland. Was educated for the Rom. Catholic priesthood, but emigrated to America in 1819. He earned his living for a time by teaching languages and translation, but eventually became a successful journalist, founding the *New York Herald* in 1835.

Bennett, James Gordon, son of the above, born May 10, 1841. He succeeded to the management of the *New York Herald* on his father's death, and is the present editor and proprietor. He despatched H. M. Stanley to Central Africa to find Livingstone, arranged the Jeannette Polar expedition, and promoted, with J. W. Mackay, the Commercial Cable Company in 1883.

Bennett, John Hughes (1812-75), a physician and pathologist, was born in London. He was educated at Exeter and Edinburgh, and studied for four years in Paris and Germany. In 1841 he began to lecture on histology in Edinburgh, and in 1843 was appointed professor of the Institutes of Medicine at Edinburgh. This post he resigned in 1874. He published numerous treatises on the subject of medicine.

Bennett, Sir William Sterndall, Mus.D., D.C.L. (1816-75), Eng. composer and pianist, born at Sheffield. For ten years he studied in the Royal Academy of Music and then visited Germany, where, at Düsseldorf and Leipzig, he made the acquaintance of Mendelssohn and Schumann. On his return to England he received a warm reception, and in 1838 was elected member of the Royal Society of Music. In 1856 he became professor of music at Cambridge, and was engaged as conductor to the Philharmonic Society the same year. This latter post he resigned on being appointed prin. of the Royal Academy of Music in 1866. He received the honorary degree of D.C.L. from Oxford University in 1870, and the following year was knighted. He died at St. John's Wood.

With the exception of the opera, B. attempted almost every form of vocal and instrumental composition. *The Wood Nymphs* and *The May Queen* (a cantata) are among his best known works.

Ben Nevis, the highest mt. in the British Isles, situated in the co. of Inverness, 4½ m. E.S.E. of Fort William. Its elevation is 4406 ft., but on account of its bulk it is much less striking than many other Highland mts. of lower altitude. The N.E. side is bounded by a precipice of about 1500 ft. in depth. On its summit, which consists of a large plateau, snow lies in some gorges all the year round. An extensive view is obtained therefrom, every mountain of any size in Scotland being visible. From 1881 to 1904 meteorological observations were taken at the summit, and until the erection in 1883 of an observatory and the construction of a bridle road leading up the side of the mt., daily ascents were made for that purpose. The base of the mt. which, in circumference, measures about 30 m., is composed principally of granite and gneiss, while the upper part is formed chiefly of porphyry.

Bennigsen, Levin Augustus Theophilus, Count (1745-1826), a Russian general, was born at Brunswick. After a period in the Hanoverian service he entered the Russian army and gained distinction in the Turkish and Polish wars. Aided in the assassination of Tsar Paul V. Commanded the Russian armies against Napoleon at Poltusk (1806) and Eylau (1807) and was present at Borodino (1812) and Leipzig (1813).

Bennington, a township of the co. of B., Vermont, U.S.A. It has woollen mills, and manufs. stereoscopes, boxes, and linen. Pop. (1900) 8033.

Benoit, Peter Léonard Léopold (1834-1901), Flemish composer, born at Harlebeke, Flanders. In 1851 B. entered the Brussels conservatoire, where he studied till 1855. There he composed an opera, *Le Village dans les Montagnes*, for the Park Theatre. After travelling in France and Germany B. returned to Antwerp and there produced a sacred tetralogy, consisting of his *Cantate de Noël*, a Mass, a Te Deum, and a Requiem; in this music he meant to introduce the world to a new Flemish school of music, but there is nothing in his music that characterises it as specially Flemish.

Benoît de Sainte-More, Fr. *trouvère* of the 12th century. He wrote a long poem in octosyllabic verse entitled *Chronique des Ducs de Normandie* at the suggestion of Henry II. of England. His *Romance of Troy* is based on the *Historia de excidio Trojæ* of Darès, the Phrygian, and the *Ephemerides belli Trojani* of Dictys of Crete. The story is not classical in spirit. The Gk. heroes act like person-

ages of mediæval romance. The story commences with Jason's theft of the Golden Fleece and ends with the return of the Gk. heroes after the sack of Troy. B. is also supposed to be the author of *Enéas* and *The Romance of Thebes* (based on Statius).

Ben-Rhydding is a hydropathic establishment in the W. Riding of Yorkshire, on the bank of the R. Wharfe, 16 m. N.W. of Leeds.

Bensberg, a vil., prov. Rhineland, in the dist. of Cologne, Prussia, about 10 m. E. of Cologne. B. has rich lead, iron, and zinc mines. Pop. 10,410.

Bensheim, an old. tn. of Hesse, 14 m. S. of Darmstadt. Pop. about 7500.

Bensley, Thomas (*d.* 1833), London printer and producer of some of the finest and most magnificent books of that period. His chief production was Macklin's folio Bible, and his octavo Shakespeare is also well known. His typography was excellent.

Benson, Arthur Christopher, author and essayist, born on April 24, 1862, the eldest son of Archbishop B. Educated at Eton and King's College, Cambridge, he became a master at Eton in 1885, continuing there until 1903 when he was elected a Fellow of Magdalene College. In 1886 he produced his first work of fiction (*The Memoirs of Arthur Hamilton*) under the *nom de plume* of Christopher Carr. Two vols. 'Poems' and 'Lyrics' pub. in 1893 and 1895 respectively gave him a reputation as a writer of verse. Further literary productions of his are: *A Study of Archbishop Laud*, 1887; *Lord Vyet and other Poems*, 1897; *The Life of Archbishop Benson*, 1899; *Fasti Etonenses*, 1899; *The Schoolmaster*, 1902; *House of Quiet*, 1903. Monographs in the 'English Men of Letters' series on *D. G. Rossetti*, 1904; *Edward Fitzgerald*, 1905; *Walter Pater*, 1906. *Peace and other Poems*, 1905; *The Upton Letters*, 1905; *From a College Window*, 1906; *Thread of Gold*, 1906; *Beside Still Waters*, 1907. He also ed. with Lord Esher *The Correspondence of Queen Victoria*, 1907.

Benson, Edward Frederick, author, son of Archbishop B., born on July 24, 1867. He was educated at Marlborough and King's College, Cambridge. From 1892 to 1895 he was engaged in investigations at Athens on behalf of the British Archæological Society, and was subsequently similarly employed in Egypt in the interests of the Hellenic Society. In 1893 he pub. his first novel *Dodo*, a story of society life. Many further novels from his pen have since appeared.

Benson, Edward White (1829-96), Archbishop of Canterbury, was born at Birmingham. Entering Trinity College, Cambridge, in 1848, he was elected fellow in 1853. From this date until 1859 he was a master at Rugby, being appointed in the latter year head master of the newly opened Wellington College. In 1865 he was made prebendary, and three years later, chancellor of Lincoln. In 1877 he was transferred to Cornwall to become the first Bishop of Truro and on the death of Dr. Tait in 1883, succeeded him as Primate of England.

As primate he successfully cultivated cordial relations with the eastern churches and took an active part in eccles. legislation. He imparted new vigour to church life in England and reorganised the internal administration of the church. Many of his numerous writings possess considerable scholastic and antiquarian value.

Benson, Frank R., actor-manager born in 1858. His education was at Winchester and Oxford. In 1884 he founded the Shakespearian *repertoire* company which bears his name. He has also been responsible for most of the Shakespearian festivals at Stratford-on-Avon. In 1886 he married Miss Constance Featherstonhaugh.

Benson, Robert Hugh, author and priest of the Roman Church, born in 1871, the son of Archbishop B. He was educated at Eton and Cambridge, and held curacies for some years as a priest of the Established Church. He has written both novels and religious works. The best known are: *The Light Invisible, By What Authority? The Conventionalists, The Sentimentalists, The Religion of the Plain Man, The Dawn of All.*

Bent, James Theodore (1852-97), Eng. traveller and archæologist, was born near Leeds. He was educated at Repton and Oxford (Wadham College). He became acquainted with Italy and Greece, and in 1885 commenced investigations in Asia Minor. In 1891 he visited S. Africa, exploring the Great Zimbabwe ruins in Mashonaland. In 1893 he explored parts of Arabia and Abyssinia. Chief works: *The Cyclades, or Life among the Insular Greeks*, 1885; *The Ruined Cities of Mashonaland*, 1892; *The Sacred City of the Ethiopians*, 1893. In 1900 his wife published *Southern Arabia.*

Bent Grass is a name applied to many varieties of Gramineæ under the generic name of Agrostis which grow in a northern temp. *A. alba*, the white B. G., marsh B. G., or florin grass, is valuable as food for cattle; it creeps along the ground and roots at the nodes of its bent and wiry stems. *A.* (or *Apera*) *spica-venti* is the silky B. G., or windward-spiked

grass, which is found commonly in Britain. *A. vulgaris* and *A. stolonifer* are varieties of *A. alba*; *A. canina* is the brown B. G. which grows on peaty soil.

Bentham, George (1800-84), English botanist, born at Stoke, near Portsmouth. A nephew of Jeremy B., he was attracted to the study of botany through the applicability thereto of the analytical methods learnt from his uncle. For some years he lived in France managing his father's estate, eventually coming to England to study law and to assist his uncle. On his uncle's death in 1832 he was able to follow up more fully his scientific inclinations, and finally in 1642 he removed to Herefordshire to devote himself entirely to science. The cost of maintaining his herbarium proved too expensive, however, and in 1854 he presented his collection to Kew Gardens, and himself resided and worked there until the year of his death. He produced several important treatises on botany, the chief being *Genera Plantarum*.

Bentham, James, was educated at Trinity College, Cambridge, and in 1736 became a minor canon of Ely, and after various preferments obtained a prebendal stall in that cathedral in 1779. From his first connection with the church of Ely, Mr. B. appears to have directed his attention to the study of church architecture, the varieties of which, from the earliest period to the time of the Reformation, [illegible] in his view. His [illegible] *of Ely* was pub. [illegible] of the best works on eccles. antiquities in our language. He died at his prebendal house at Ely, where he had resided for the greater part of his life, in 1794.

Bentham, Jeremy (1748-1832), a writer on law and political economy whose influence was greater than his fame; the son of Jeremiah B., a solicitor of London. Educated at Westminster and Oxford. Studied law and was called to the bar about 1772, but did not practise to any great extent. He had attended, at Oxford, Blackstone's lectures on Eng. law, but was not satisfied with him. His first publication, *Fragment on Government*, 1776, was an attack on Blackstone, and was attributed by Johnson to Dunning. In 1780 he wrote his *Principles of Morals and Legislation*; it was printed but not published until 1789. In 1785 he went abroad and travelled over the greater part of Europe, and on his return in 1791 pub. his *Panopticon on the Inspection House*, a valuable work on prison discipline. This was taken up by the gov., experimented upon at great expense, and dropped. At this time B.'s fame abroad was greater than here, and every embryo-republic looked to him. Borrow met an Alcayde near Finisterre who spoke of the 'great Baintham.' From about 1817 on he was bencher of Lincoln's Inn; he died at Westminster. Among his other works are *Discourse on Civil and Penal Legislation*, 1802; *Punishments and Rewards*, 1811; *Parliamentary Reform Catechism*, 1817; *A Rationale of Judicial Evidence*. He was the prophet of Utilitarianism, but was inclined to let his personal feelings get the better of his philosophy—not an uncommon thing. He is still regarded in the light of a Solomon by money-lenders, extracts from his *Defence of Usury* being still hung round their rooms like biblical texts in a Sunday-school. He left his body to be dissected, and his skeleton may be seen at the University College, London. J. H. Burton brought out an ed. of his works, with a Life by Sir John Bowring, 1844. See *Study of Life and Work of Bentham*, Atkinson, 1903.

Bentham, Sir Samuel (1757-1832), naval architect and author of several works on naval administration, was the brother of Jeremy B. He travelled for some years in Russia, and became an officer in the Russian service. On his return to England, he became inspector-general of naval works and naval architect and engineer.

Benthamia, a genus of plant of the natural order Cornaceæ. *B. frugifera* a native of India is found to thrive in the open air in the S. of England. It possesses a mulberry-like fruit and a fragrant bloom.

Bentheim, a dist. of Prussia which includes the forest of B., where is situated the old castle of the counts of B. Pop. 35,000. The chief tn. of the dist., B., is celebrated for its sulphurous mineral springs, and has manufs. of bricks, and cotton-weaving. Pop. 3000.

Bentinck, William (c. 1649-1709), first Earl of Portland, the son of Henry B. of Diepenheim, Overyssel. In his youth he was attached to the Orange household and grew to be William III.'s friend and confidential adviser. He negotiated William's marriage with Mary, daughter of James II., and was entrusted with a large share in the preparations for William's landing in England in 1688, the success of which placed William and Mary on the English throne. B. was rewarded for his services by being created Earl of Portland and receiving other honours. Although he held military commands in the wars with France and in Ireland he was chiefly employed on diplomatic missions. In 1699 he grew intensely jealous of other

court favourites and resigned all his offices.

Bentinck, Lord William Henry Cavendish (1738-1809), third Duke of Portland. Entered parliament as a staunch Whig in 1761, and held office under Rockingham in 1765 and 1782. Was put forward as nominal leader of the coalition ministry by Lord North and Fox in April, 1783; but growing weary of Whig dissensions, he withdrew into private life soon after its defeat in the following December. With the events of the French Revolution his interest in politics reawakened, and for seven years he was Home Secretary in Pitt's Tory administration. As leader of the 'Ministry of all the Talents' in 1807 he was second time Prime Minister, but being unequal to the task, resigned in October 1809. A few weeks later he died.

Bentinck, Lord William Henry Cavendish (1774-1839), a general and administrator, second son of the third Duke of Portland. Entered the army in 1791, and in 1803 was nominated governor of Madras, but certain reforms he introduced having provoked a sepoy mutiny, was recalled in 1807. The following year he was sent to Portugal and served under Sir J. Moore at Corunna. Subsequently, he proceeded as envoy to Sicily and commanded the British forces there. Leaving Sicily in 1814 he held no post until 1827, when he succeeded Lord Amherst as governor-general of India. During a popular and successful administration lasting eight years he introduced many reforms. On his return to England he sat as M.P. for Glasgow. He died at Paris.

Bentinck, Lord William George Frederick Cavendish (1802-48), politician and sportsman, the third son of the fourth Duke of Portland. Entering the army in 1819, he retired in 1822 to become private secretary to his uncle, George Canning, whom, in 1828, he succeeded as M.P. for Lyme Regis. At first professing no party, he afterwards attached himself to the Conservatives and voted with them until 1846, when he became leader of the Protectionist party, created in consequence of Sir R. Peel's conversion to Free Trade principles. Lord George became a vigorous speaker in parliament, displaying intense bitterness towards Peel. He died suddenly on Sept. 21, at Welbeck. He was at one time a great patron of the turf, but abandoned his sporting pursuits on entering into politics.

Bentivi, or Bientiveo, the Brazilian name of the *Tyrannus sulphuratus*, a species of Tyrannidæ. It is related to butcher-birds and shrikes, and feeds on carrion and reptiles.

Bentivoglio, Ercole, was grandson of Giovanni. He was born at Bologna in 1506. He was employed by the House of Este in sev. important missions, during one of which he died at Venice in 1573. Ercole wrote some *Satires*, which are considered next in merit to those of Ariosto, and also several *Commedie*, which were much applauded at the time; he was also a lyric poet of some celebrity.

Bentivoglio, Giovanni, son of Annibale B., who, after being for some years at the head of the commonwealth of Bologna, was murdered by a rival faction in 1445. Giovanni was then a boy of six years of age, but in 1462 he made himself master of Bologna. Though stern and vindictive in his gov., like his more illustrious contemporary, Lorenzo de' Medici, B. was a patron of the arts and of learning; he adorned Bologna with fine buildings and made collections of statues and paintings, and of MSS. Pope Julius II. expelled him from Bologna in 1506, and after forty-four years' dominion he was obliged to escape with his family into the Milanese ter., where he died two years afterwards at the age of seventy. His two sons were replaced by the Fr. in 1511 at the head of the gov. of Bologna, but in the next year, the Fr. being obliged to leave Italy, Bologna surrendered again to the pope in June, 1512, and the Bs. emigrated to Ferrara, where they settled under the protection of the Duke d'Este.

Bentivoglio, Guido, born at Ferrara in 1579, was a descendant of the Bs. who had been rulers of Bologna in the preceding century. He studied at Padua, and returned to Ferrara in 1597. When the pope soon after came to Ferrara he took particular notice of young Guido; and when Guido in 1601 proceeded to Rome he was made a prelate of the papal court. After the death of Clement in 1605 his successor, Paul V., sent him as nuncio to Flanders, where he wrote his historical work on the insurrection of that country against the Spaniards in 1566 (*Della Guerra di Fiandra*, in three parts, 3 vols. 4to, Cologne, 1632-9). In 1616 B. was sent as nuncio to France, where he won the favour of Louis XIII. and his court by the mildness and courteousness of his manners and his prudence and tact in diplomatic affairs.

The other works of B. are *Relazioni fatte in Tempo delle Nunziature di Fiandra e di Francia*, 4to, Cologne, 1630. It was trans. into Eng. by Henry, Earl of Monmouth, fol., London, 1652. *Memorie con le quali descrive la sua Vita*, 8vo, Amsterdam

1648: this is a sort of diary of his life, pub. after his death. *Lettere*, 8vo, Rome, 1654.

Bentley, Richard (1662-1742), divine, scholar, and critic; born at Oulton in Yorkshire of humble parents; educated at Wakefield and St. John's College, Cambridge. He became a schoolmaster at Spalding, 1682, but left this to be private tutor to the son of Dr. Stillingfleet (afterwards Bishop of Worcester). He accompanied his charge to Oxford, and was soon admitted to the degree of M.A. Here he had access to the Bodleian Library, and made the friendship of Mill, the editor of the Greek Testament, and Bernard, then Savilian professor. To the ed. of Callimachus by Grævius, in 1697, he contributed a collection of fragments of that poet. He laid the foundation of his reputation in a dissertation on an obscure chronicler, Malelas by name, which was pub. with an appendix to Dr. Mill's edition of the author in 1691. In 1692 he was appointed keeper of the King's Library, and in 1694 Boyle Lecturer; his degree of D.D. he took at Cambridge in 1696. Now it was that his famous quarrels with the Hon. C. Boyle began; the latter was to edit the *Epistles of Phalaris*, and noticing (rightly or not) some want of courtesy on the part of B. regarding the loan of a certain manuscript in the King's Library, animadverted upon it with some petulance in his preface. B., who had decided before (as was right) that these epistles were spurious, said so in Wotton's *Reflections on Ancient and Modern Learning*, and criticised Boyle's performance with some asperity. Whereupon all the wits of Christchurch, chief among whom was Atterbury, set their heads together and wrote an answer, to the delight of the town, with whom the arrogant B. was in little favour. Theirs was the wit, but B. had the learning. In 1700 he became master of Trinity College, Cambridge, and next year he married. He helped Kuster with an edition of Suidas, and pub. an edition of Horace, 1711; he wrote two critical letters on Aristophanes, and in 1708 sent to Hemsterhuis a valuable letter containing emendations of the fragments of comic writers in Julius Pollux's *Onomasticon*, an ed. of which Hemsterhuis had just pub. If his learning was great, his manners were harsh and overbearing, and he quarrelled with the seniors. He was deprived by the visitor, Bishop Greene, but B., by a number of expedients, resisted the deprivation for four years, and the matter was dropped. In 1717 he was, by his bold and unscrupulous manœuvres, elected regius professor of divinity; litigation followed as usual, and as usual B. won. He effected the publication of Cote's ed. of Newton in 1709. His valuable ed. of Terence appeared in 1726. He undertook an ed. of *Paradise Lost* in 1731, supposing that Milton's amanuensis was likely to have committed blunders in taking down the poet's words; if his criticisms and emendations are prosaic, they are ingenious, and though he was unable to appreciate the effect on Milton of it. poetry and romantic study, yet Pope, who was no genius at editing himself, and in the matter of verbal criticism was not worthy to comb B.'s wig, had no business to put him into the *Dunciad*. Of B. we can only say that what he lacked in manners and modesty (and he lacked a good deal) he made up in learning. His style was strong and flexible. Swift's *Battle of the Books* is an account of B.'s quarrel with Boyle. *See* Macaulay's 'Atterbury' in *Ency. Brit.*; *Life of Bentley*, by Monk, 1833, by Jebb, 1882.

Benton, Thomas Hart (1782-1858), an American statesman, was born at Hillsborough in N. Carolina on March 14. He was brought up near the border of the Indian country and developed strong democratic principles. He represented Missouri in the United States senate from 1821 to 1851, being eventually rejected on account of his opposition to slavery. His attitude on this question, his opposition to the proposed establishment of a U.S. bank, and his strong advocacy of American expansion in the W., made him prominent in American politics. He died at Washington on April 10.

Benton Harbour, a city in Berrien, co. of Michigan, United States, on the Paw-Paw R. Besides shipping large quantities of fruit, it has many manufactures. Pop. 4000.

Benue (also Binuë and Benuwé), the largest and most important affluent of the R. Niger, W. Africa, which it joins at Lokoja. 230 m. above its mouth. It rises in Adamawa, and flows through a very fertile country, navigable for 700 m., thus affording a highway into the centre of Soudan. Explored by Dr. Baikie in 1854 and 1862, and Mr. Flegel, 1879-83.

Ben Venue, a mt., 2393 ft. high, on Loch Katrine, in the S.W. by W. of Perthshire, 9½ m. W. of Callander.

Benvenuto, or Tisio da Garofalo (1481-1559), It. painter, last representative of the Ferrara school, and follower of Raphael. In the church of San Niccolo at Ferrara he painted in 1520 the 'Virgin Mary and Infant Jesus,' in the church of Santa Maria de' Servi the 'Nativity,' and in San Lorenzo the 'Adoration of the Magi.' His best work is a 'St. Sebastian,

St. Roch, and St. Demetrius ' in the National Gallery, London.

Benvenuto Cellini, *see* CELLINI, BENVENUTO.

Ben Voirlich, a mt., 3092 ft. high, *in Dumbartonshire, Scotland*, 12 m. E. by N. of Inverary.

Ben Wyvis, a mt. in Ross, Scotland, 8 m. N.W. of Dingwall. Alt. 3429 ft.

Benyowsky, Mauritius Augustus, Count de (1741-86), magnate of Poland and Hungary; Austrian soldier and adventurer; *b.* in Nittria in Hungary; 1756 fought in the Seven Years' War; 1761 joined his uncle, who was a magnate in Lithuania; on his father's death his uncle seized the property that should have fallen to B., and he armed his peasants to do himself right by force; he was quelled by the Austrian gov., but his wrongs were never righted. He came to Holland and England, and in 1767 went to Poland to help to resist the encroachments of the Russian Empress Catharine; he was captured and imprisoned at Cazan, but joined a Russian conspiracy against Catharine; it failed, and he escaped with one conspirator. At St. Petersburg he was captured again and banished to Kamchatka; escaped once more with eighty-five other exiles, took ship and went to Macao in China. On his arrival in France he had permission from the Fr. gov. to form an establishment at Madagascar, where he had called on his way back from China; he was repulsed by the natives. He returned once more on behalf of the Eng. gov., and this time was killed by a Fr. army. *See* his *Travels*, trans. into Eng. 1790.

Benzaconine, an organic compound which forms the chief constituent of the alkaloids picraconitine and rapelline. It is prepared by hydrolysis from aconitine, the active principle of aconite or monkshood.

Benzaldehyde (C_6H_5CHO), a colourless [illegible] odour of bitter almonds, [illegible] naturally in bitter almonds, cherries, and peaches in the form of amygdalin (*q.v.*). It is also prepared from toluene, which is converted into benzyl chloride and then heated with lead nitrate. *See* ALMONDS, OIL OF.

Benzamide ($C_6H_5CONH_2$), an organic compound formed by acting upon ammonia with benzoyl chloride. It crystallises in leaflets which melt at 130° C. and boil at 288° C.

Benzene (C_6H_6), a compound of carbon and hydrogen produced in the distillation of coal-tar. It was dis- [illegible] °25 as pro- certain oils 345 showed of coal-tar.

To separate the various hydrocarbons in coal-tar, the substance is distilled in a tar-still, the products being drawn off at different temps. The first fraction is taken up to 210° C., and contains a large percentage of B. The distillate, known as 'light oil,' is again fractionated, producing separate distillates of 'first runnings,' 'heavy benzols,' and 'carbolic oil.' A further distillation of the benzols in a steam-still produces pure or nearly pure B. B. is a light, colourless liquid with a pleasant odour. It crystallises in rhombic form at 0° C., melts at 5·4° C., and boils at 80·4°. It is insoluble in water, but dissolves in alcohol, ether, acetic acid, and carbon disulphide. It readily dissolves gums and fatty substances, as well as phosphorus, sulphur, and iodine. B. is interesting chemically as being the parent of the aromatic compounds. The atoms of carbon are represented in a graphic formula as being arranged in a closed ring, each atom being connected with an atom of hydrogen. The replacing of these atoms by other atoms or groups gives rise to a large number of derivatives, which have in general more strongly marked characteristics and are more stable than the aliphatic or fatty compounds. B. is used commercially as a solvent, and as a starting-point in the production of many valuable dyes. The name is often applied to *benzol*, which consists of B. and toluene. *Benzine* is a distillate from American petroleum, and is much used as a solvent. *Benzoline* is a name applied to a form of benzine; it is used as a solvent and as a fuel.

Benzil ($C_6H_5CO.CO.C_6H_5$), an organic solid, crystallising in trapezohedra. It is produced by treating benzoin with chlorine and nitric acid, or by fusing it with an alkali.

Benzine, a volatile liquid obtained from petroleum. The name has been applied, however, to different organic compounds. The hydrocarbon now known as benzene (C_6H_6) was originally known as B., and the name was afterwards and is still applied to the partially purified coal-tar oil which contains benzene as its principal constituent. The term B. is, however, most commonly applied to the lower boiling-point fractions in the distillation of petroleum, and has thus a kinship with petrol, petroleum spirit, motor spirit, benzoline, etc. It is valuable as a solvent, and is used for cleaning wearing apparel, etc.

Benzoene, a name formerly applied to the hydrocarbon now known as *toluene*.

Benzoic Acid (C_6H_5COOH), an aromatic acid, occurring naturally in some resins, especially gum benzoin and in Peru and Tolu balsams. It may be obtained from benzoin by sublimation, from toluene by oxidation

and from hippuric acid by hydrolysis. It crystallises in light feathery plates, which melt at 121·4° C. and boil at 250° C. It is readily soluble in hot water, alcohol, etc. When heated with lime, benzene is produced, and salts called benzoates are formed by combination with the oxides of many metals. In medicine it is used as an antiseptic, expectorant, and diuretic. Moderate doses remain unchanged in the blood, but unite with glycocoll in the kidneys to form hippuric acid. It is useful in mild chronic cystitis and in urethral affections.

Benzoin, a balsamic resin obtained from *Styrax B.* It is produced by cutting the bark of trees, and is apparently the result of the wound, and is not secreted by the plant under ordinary conditions. There are different varieties containing different proportions of the active ingredient, benzoic acid, while in some samples this is partly or wholly replaced by cinnamic acid. B. has a fragrant odour, and is much used for incense, perfumery, and pastilles. It has long been a favourite medicament on account of its antiseptic property and its soothing influence in affections of the respiratory organs. The most popular form of the medicine is the compound tincture, or friar's balsam, which is used externally for sores, ulcers, etc., and internally for throat troubles. Inhaling the vapour produced by adding a small quantity of friar's balsam to hot water is very effective in cutting short catarrh and influenza.

Benzoline, a mixture of hydrocarbons (also known as benzine, petroleum spirit, or petrol). It is not a definite chemical compound, and consists of the lighter fractions in the distillation of petroleums or paraffins. It is used as a solvent in industry, and in medicine for heating cauteries and for cleansing the skin in acne. It is also used in oil engines to provide the inflammable vapour which, mixed with air, produces the explosion or expansion of gases which actuates the piston. It must be distinguished from benzol or benzene, which are products of coal-tar distillation, though like them, it has valuable solvent powers.

Benzoyl, a hypothetical organic radicle represented by the formula C_7H_5O. In 1832 Baron Liebig, in association with F. Wöhler, published a paper showing that throughout a series of compounds formed from benzaldehyde, or oil of bitter almonds, a group which he called B. behaved as an element. A new era in chemical theory was thus inaugurated which has led to far-reaching results.

Benzyl Alcohol ($C_6H_5CH_2OH$), or **Phenyl Carbinol**, an organic compound found in Peru and Tolu balsams and in storax. It may be prepared by reducing benzoyl chloride or by shaking up caustic potash with benzaldehyde, when the product is partly benzoic acid and partly benzyl alcohol. It is a colourless liquid with a pleasant odour, and boils at 206° C.

Benzyl Chloride ($C_6H_5CH_2Cl$), an organic substance produced by the action of chlorine on boiling toluene. By the addition of potassium carbonate, benzyl alcohol is produced, and heating with lead nitrate produces benzaldehyde, or oil of bitter almonds.

Beöthy, Zoltan, Hungarian author, born at Komoru in 1848. Since 1882 he has been professor of æsthetics at Budapest University. He has pub. sev. novels, praised for their realism and character-drawing, and also a *History of Hungarian Literature*, and a *History of Hungarian Prose*.

Beowulf, an epic poem, and considered the most valuable example of Old Eng. and early Germanic literature. It consists of a MS. written about A.D. 1000, and contains the Old Eng. poem 'Judith.' It is now in the British Museum, where it is bound with other MSS. in the Cottonian collection. The poem relates the deeds of B., nephew of the king of the 'Geâtas' (the people). Briefly, the story describes how B. sails to Denmark, accompanied by fourteen companions, to help his brother Hrothgar, the Danish king, whose domains are ravaged by a monster of human shape called Grendel. In the encounter between B. and Grendel, the voracious monster's arm is torn from the shoulder, but though mortally wounded the creature escapes, leaving bloody tracks which lead to a distant lake. The deserted hall, called Heorot, is once more inhabited, but Grendel's mother appears and carries off a Danish noble. B. undauntedly follows her, and plunging into the water of the lake, kills her in a vault under the waves. He finds Grendel's corpse here, and securing the head, returns to Heorot, where he is welcomed with acclamation. The king of his native land rewards him with lands, and on his death B. is proclaimed king. Fifty years pass, and now B. himself is suffering from the incursions of a monster in the shape of a fiery dragon. The fight here is more terrible than that with Grendel and his mother, and B. is just able to kill the fire-breathing dragon, by the aid of a young man named Wiglaf. But B. is mortally injured, and with his dying breath ordains Wiglaf his successor. B.'s burial takes place amid universal lamentation, and his body is burned together with the treasure obtained from the abode of the dragon. Such

is the story, like all epics a mixture of history and mythology. The epic was composed in a period when poems were recited rather than read; and though B. would be too long to declaim at one sitting, yet the custom of [illegible] of favourite her [illegible] demand expressed by the hearers, would cause its gradual enlargement.

Bequeath, Bequest, two words strictly applicable in Eng. law to the disposition of personal property by will, the word 'devise,' being the technical term to apply to disposition of real property. *See* WILL.

Berabra, Nubian people of Egypt, chiefly found in the neighbourhood of the Nile from Assuan to Wadi Halfa. They are also found in Kordofan and Dar Fur. They are not, as some suppose, of old Egyptian line, for their facial angle shows that they originally came from negro stock. They are honest, intelligent, and quick to acquire new methods of agriculture, which is their chief employment. In religion they are Mohammedans.

Berææns, *see* BEREANS.

Béranger, Pierre Jean de (1780-1857), a Fr. song-writer. He was born in Paris, and his father abandoned Pierre's mother only six months after the marriage. During his childhood B. was under the care of his grandfather, Champy, a tailor. At the age of nine he was transferred to the protection of an aunt, who kept an inn at Péronne. Her vigorous republican ideas were passed on to her nephew Pierre. He became a printer's apprentice for three years at the age of fourteen, subsequently acting as a clerk in the service of his father, who had acquired a fortune, and who very soon afterwards lost it. B. took up his abode at Paris after this, and devoted himself to the study of literature. At this time he lived in a garret, which forms the subject of one of his songs. Adversity, however, shattered some of the dreams he had hoped to realise, and he was forced to solicit help from Lucien Bonaparte. Three years later he was given a position as clerk in the Imperial University, through the influence of the poet Arnault. In 1815 he pub. his first collection of songs, and was immediately recognised as the foremost of his country's song-writers. His greatest friends were the artisans, and his enthusiasm and sympathy for them were profound. His popularity increased, and also his courage in airing revolutionary ideas, for in 1821 he was imprisoned in St. Pélagie. Later, undaunted, he again incurred punishment, and this time was incarcerated in La Force. Here he was visited by some of the greatest men of the day, among whom were Hugo, Dumas, and Saint-Beuve. In 1830 *Chansons Nouvelles* were published, and ten years later his life story. By over 200,000 votes he was elected to enter the Constituent Assembly, though reluctantly. He resigned shortly afterwards, and sought retirement till his death in July. The versatility of theme and light delicacy of his humour and pathos easily explain his powerful hold upon a public so warm as the working class of France, while his technique and literary quality endeared him no less to the literary scholars of his day.

Berar, or **Hyderabad,** is a prov. of [illegible] by the Madras Presidency and Mysore. It is watered by the Godaveri, the Taptee and Mahanuddy, and the Krishna, and has a fertile soil, producing large quantities of wheat and cotton. It was taken by the Moguls in the 17th century, after being ruled by independent sovereigns, was afterwards devastated by the Mahrattas, and finally divided between the Peshwa and the Rajah of Nagpore. In 1861 B. was transferred to British dominion in exchange for some other dists., and to cancel a debt of two millions. The Nizam is the first native Indian chieftain. Pop. 13,000,000.

Berat, the cap. of Jannina, of S. Albania, Turkey. It is situated on the R. Ergene, a trib. of the Semeni. Pop. (1900) 15,000. Products wine, olive oil, fruit, and grain.

Beraun, a tn. in Bohemia, Austria: pop. 9693 (1900). It has lime-kilns, textile manufs., sugar refineries, and breweries.

Berber, a tn. and prov. in Anglo-Egyptian Soudan, near the junction of the Atbara and the Nile. The tn. was the starting-point of the old caravan route across the Nubian Desert to the Red Sea, at Suakin. Pop. 6000.

Berbera, or **Berberah,** the prin. seaport and tn. in British Somaliland, N.E. Africa, on a bay of the Gulf of Aden. It has a good harbour and is a great market-place for inland tribes. During the period from October to May each year, a huge fair is held, attracting more than 30,000 people from all parts of the East. The climate is good.

Berberideæ, the name applied to a group of dicotyledonous plants of the cohort Ranales, which includes the Berberidaceæ and Lardizabalaceæ. The plants are either bushes or herbs, and are found in the cooler parts of the world. The juice usually stains yellow, and the bark or stem is bitter and used medicinally.

Berberis is a genus of Berberidaceæ

containing 100 species in S. America and mountainous dists. of the tropics. The most common species occurs as a shrub in Britain, and is known as *barberry* (*q.v.*).

Berbers, the term applied to the different branches of the native 'Libyans' of N. Africa. These tribes have inhabited the region between the Mediterranean and the Sahara since the earliest times. The derivation of the name is yet undiscovered, though it may have come from βάρβαροι, barbarians. Egyptian inscriptions of the 17th and 13th centuries B.C. speak of the Barabara and Beraberata tribes. They were called 'Lebu,' 'Mashuasha,' 'Tamahu,' 'Tehennu,' and 'Kahaka' by the Egyptians. There are a host of tribes called by this term to-day, the main sections being Zouaoua and Jebalia (in Tripoli and Tunisia), the Chauwia, Kabyles, and Beni-Mzab (in Algeria); the Shlûh, Amazigh, and B. (in Morocco); and the Tuareg, Amoshagh, Sorgu (in the Sahara). The word Africa has been traced by some scholars from a tribe called Avrigha, whose descendants, the Aouraghens, form one of the innumerable lesser groups. The actual origin of the race is still involved in obscurity, and it is to be noticed that, notwithstanding the alterations in feature, usually brought about in the process of time by foreign conquest at the hands of successive invaders, the type is still surprisingly like that of the Stone Age. The usual facial characteristics are dark hair and hazel eyes, while the complexion is distinctly of the white variety. The Arabs have been the prin. invaders, and yet the races are almost as distinct as if some barrier had existed between them. In character the B. is independent, sturdy, and self-reliant, honest, intelligent, and scrupulous; in all of which virtues he forms a contrast to the Arab. The gov. of the Bs. extends over each state, which in most cases is the vil., and there is no attempt at centralisation. Yet the poorest of them has as large a share in the gov. as the richest. They are exceedingly warlike, and have never yet been thoroughly subdued. Their religion is Mohammedanism, though their zeal does not often lead to such a practical result as the observance of the ablutions. Indeed wild boars are eaten and fig wine is drunk. In spite of this evident laxity they have more reverence for their saints than the Arabs. B. women occupy an inferior position, and are procurable by purchase, and easily disposed of at will, yet they are protected by laws, and have a voice in their formation.

Berbice, the eastern portion of British Guiana. It is bounded on the E. by Dutch Guiana and R. Corentyn. Its area is 21,000 sq. m. In 1831 it was joined to Essequibo and Demerara under one gov., while formerly it formed a distinct prov. Its chief product is sugar, while rum, molasses, timber, cocoa, and tropical fruits are also features of its productions. Magnificent timber forests contain the mora and bullet trees. The R. Berbice is fed by the Canje and is navigable for 175 m. New Amsterdam is the prin. town of the division.

Berceo, Gonzalo de (*fl.* 1230), Spanish poet, considered the father of modern Spanish poetry, was one of the earliest poets in the vernacular. He follows the troubadour school of Langue d'Oc. His poems, which were very numerous, are chiefly sacred in theme and are composed in four-rhymed verse, called (*quaderna via*). His most noteworthy poems are *Milagros de Nuestra Señora*, *Vida de Santa Oria*, *Vida de Santo Domingo de Silos*, and *La Estoria de Sant Millan*. The beauty of these poems is marred by the monotonous character of the verse.

Berceuse (Fr. *berceau*), literally a cradle song; a soft lulling melody with an accompaniment to imitate rocking.

[illegible] of Antwerp, Belfine buildings

Berchem (or **Berghem**), **Nicolaas** (1624-83), a Dutch landscape painter, born at Haarlem. Studied first under his father (Pieter Claasz van Haarlem) and afterwards under Van Goyen and Weenix. He was very industrious, and produced an immense number of pictures, etchings, and drawings, which were much sought after. His work, particularly in his landscapes and etchings, is held in great esteem. Some of his best pictures are in the museum at Amsterdam. He died at Haarlem.

Berchet, Giovanni (1783-1851), It. poet and patriot, born at Milan. His connection with politics as writer for the *Conciliatore* caused him to flee to England after the Revolution, and here most of his works were pub. The following may be mentioned: *Profughi di Parga*, 1824; *Romanze; Fantasie*, 1829. His collected works were pub. with a biography by F. Cusani (Milan, 1863).

Berchta (the original of the Eng. Bertha), a fairy in S. Ger. legend. She corresponds to Hulda (gracious, benign) in N. Ger. mythology. Originally a benevolent and beautiful spirit she subsequently came to be regarded as a witch, or a bugbear, to frighten children. At one time she was worshipped by pagans as a minor deity, as shown by the existence of numerous

springs, etc., so named, in Salzburg and other places.

Berchtesgaden, a tn. of Germany, on the boundary of *Bavaria*. It is placed at a height of 1700 ft. on the Untersberg, and it is famous for its rock-salt, whose mines were worked as far back as 1174. Its other industries include toys, and horn and ivory articles. Pop. 10,046 (1900).

Berchtold, Leopold, Count (1758-1809), a Ger. medical writer, travelled through Europe, Asia, and Africa with a view to mitigating human suffering; pub. works against hasty interment and concerning sicknesses incident to seamen, and for curing them; pub. at Vienna, 1797, directions for the cure and prevention of the plague. He wrote on many similar subjects, and was active in making known the advantages of vaccination.

Berck-sur-Mer, a seaport and bathing resort in N. France, in the dept. of Pas-de-Calais, 22 m. S. of Boulogne. Pop. (1906) 7638.

Bercy is an old com. of the Seine, situated on the r. b. of that river: it has been joined to Paris since 1859, and is the chief depôt for the wines, oil, vinegar, and wood for Paris; boat-building is carried on.

Berdiansk, a seaport on the northern shore of the Sea of Azov, in the Russian gov. of Taurida. There is a good harbour; grain, wool, and hides are exported, and agric. machinery is manufactured. Pop. 30,000.

Berdichev, or **Berditchef**, a tn. of W. Russia in the gov. of Kiev, 116 m. S.W. of Kiev by rail. An important trade centre. Famous for its four annual fairs for the sale of leather, corn, wine, etc. Jews form the bulk of the population.

Berdoe, Edward (*b.* 1836), English doctor and author, born in London; educated at Regent's Park College and London Hospital Medical College; has practised in Hackney since 1876. He is editor of the *Zoophilist*, and has written many medical works, but his hobby has been the study of Browning. He was on the committee of the [illegible] from its foundation

[illegible] *Primer*, 1905.

Berea: 1. A suburb and park of Durban (Port Natal), Natal. The suburb is picturesquely situated and commands the harbour. 2. A [illegible]terial dist. in Basutoland, Maseru, and containing the r[illegible] station of Berea.

Bereans, an almost extinct sect of Christians founded in Scotland in the 18th century by the Rev. John Barclay (1734-98), a native of Perthshire. They are so-called after the people of Berea, of whom it is said in Acts xvii. 11, that 'They received the word with all readiness of mind.' The B. hold that the knowledge of the existence and character of God can be obtained from the Bible alone, not from nature or reason; that the Psalms of David refer to Christ alone; that assurance is of the essence of faith, and that lack of faith is an unpardonable sin. The rest of their doctrine is practically identical with that of the Calvinists.

Beregh is the name of a dist. of Hungary, which numbers about 200,000 inhab. The chief tn. of the district is Beregszasz.

Beregonium, an error in the Ulm ed. of the *Geography of Ptolemy*, 1486. It should be Regonium, which was the name of a tn. of Novantæ, and which now corresponds to the tn. of Innermessan, a fortified tn. on Loch Ryan, Scotland.

Beregszasz, a tn. in Hungary in co. Bereg, about 100 m. S.E. of Kaschau; pop. (1900) 9609.

Berendt, Gottlieb (*b.* 1836), German geologist, pub. in 1863 a geological chart of Brandenburg. He was appointed professor of geology at the university of Berlin, 1875. He did much valuable geological research work in N. Germany, and was one of the earliest expounders of the glacial theory. He was a violent opponent of the Darwinian theory. His two chief works are *Geognostische Beschreibung der Umgegend Berlins*, 1885, and *Die Theorie Darwins und die Geologie*, 1870.

[illegible]enger or Beren-
, 888-924, son of
iuli, and grand-
ouis le Débon-
throne in pre-
ference to Guido, Duke of Spoleto, he maintained his position against all rivals until 923, when he was overthrown by Rudolf, King of Burgundy. The following year he was assassinated.

Berengar II., King of Italy, 950-961, grandson of Berengar I. In 952 the Emperor Otto I. compelled B. to become a feudal dependent of Germany. In 961 B. was dethroned by the emperor, and eventually died, in 966, in a Bavarian prison.

Berengaria, daughter of Sanchez VI., King of Navarre, and Blanche of Castile, and queen of Richard I., Cœur de Lion. She married Richard in the is. of Cyprus in 1191, when he was [illegible] the crusadic wars. [illegible] him to Palestine, she [illegible]ere until Sept. 1192, [illegible]n advance of the king,

and safely reached Sicily, and eventually Poitou in France. The king, less fortunate, was taken prisoner by the Archduke of Austria. B. was reduced to dire straits after Richard's death in 1199 but received assistance from the Templars. She died childless in 1230. She was famed for her beauty and wisdom.

Berengarius of Tours, scholar and theologian, was *b.* at Tours about 998. He was a pupil of Fulbert de Chartres. In 1040 he became archdeacon of Angers, and soon after commenced to attack the dogmas of transubstantiation and the real presence. He was summoned before the councils of Tours (1054) and Rome (1059), was condemned for heresy and forced to recant. His abjurations were soon followed on each occasion by a vigorous re-assertion of his heretical doctrines, and in 1079 he was again summoned to Rome. Again he 'abjured' his 'error,' and again he subsequently withdrew his 'abjuration.' Soon afterwards, the opposition to his teachings proving too strong, he retired to an island near Tours, and died there in 1088.

Berenger (called **Berenger of Tours**) (998–1088), a celebrated Fr. divine, was born in Tours of a rich and distinguished family. After studying at Chartres under Fulbert, he returned to Tours in 1031, and was made teacher in the monastery of St. Martin. He continued to reside at Tours, though he was made archdeacon of Angers in 1040. B. agreed with the doctrine expressed by Scotus Erigena in the preceding century, and openly taught it. He denied transubstantiation, and saw nothing but a symbol in the sacrament of communion. He developed these views in a letter to Lanfranc, prior of Bec, and was accordingly condemned for them by the councils of Verceil in 1050, Tours in 1054, and Paris in 1059. He thereupon abjured his former views, and burnt his documents expressing them, but later again went back to his heretical opinions. On being condemned by Rome, however, he repented, and finished his life as a rigorous ascetic.

Berenice, an antique seaport of Egypt, situated on the E. coast of the Red Sea. It stands at the head of a gulf, and its harbour has been almost blocked by a sand-bar. Among its important ruins is a temple. It was founded in 285 B.C. by Ptolemy II.

Berenice: 1. One of the four wives of Ptolemæus I., the founder of the dynasty of the Lagidæ in Egypt, and the mother of Ptolemæus II., called Philadelphus. B. had a son, Magus, by a former husband, who was afterwards King of Cyrene. 2. A daughter of Ptolemæus Philadelphus by Arsinoe, the daughter of Lymsimachus. She was the sister of Ptolemæus III., Euergetes, and was given in marriage, 252 B.C., by her father to Antiochus II., King of Syria, called Theus, God, who divorced his wife Laodice on the occasion. After the death of Philadelphus, Antiochus divorced B. and took back Laodice, who poisoned her husband and put B. to death, together with a son whom she had by Antiochus. To avenge his sister's death Ptolemæus III., Euergetes, invaded Syria, put to death Laodice, and overran the empire of the Seleucidæ. 3. Wife (c. 248 B.C.) of Ptolemæus III., Euergetes; but her parentage is doubtful. This B. is said to have made a vow of her hair during her husband's wars in Asia. The hair was placed in the temple of Venus, from which it was stolen, but Conon of Samos declared that it had been taken up to the skies and placed among the seven stars in the lion's tail. Callimachus wrote a poem on the occasion, which is now only known from the beautiful translation by Catullus, *De Coma Berenices*. B. was put to death by her son Ptolemæus IV., Philopator, and his infamous minister Sosibus. 4. Otherwise called Cleopatra, the only legitimate child of Ptolemæus VIII. (Soter II.); reigned six months, the last nineteen days of them in concert with her husband, Alexander II., who, according to Appian Porphyry, murdered her nineteen days after the marriage, 81 B.C. The portraits of Alexander II. and B. appear several times on the great wall of sandstone which encloses the temple of Edfu, and the portrait of B. is always the same. 5. A daughter of Ptolemæus IX., Auletes, who began to reign in Egypt, 81 B.C., sister of Cleopatra. During the absence of her father in Rome, B. was made regent, which office she held from c. 58-55 B.C. Gabinius, about the close of 55 B.C., came to Egypt with an army and restored Auletes, who put his daughter to death. Clinton's *Fasti Hellenici*. 6. A daughter of Herodes Agrippa I., grandson of Herod the Great. After the capture of Jerusalem she was taken to Rome, and was to have married Titus, son of the Emperor Vespasian, but on his father's death Titus unwillingly sent her away, as the match was not pleasing to the Roman people. (Suetonius, *Titus*.)

Berenicea, a genus of celluliferous coralline of the order Gymnolœmata and family Diastoporidæ. It belongs to the Bryozoans and is very abundant in the Jura and Cretaceous systems.

Berenson, Bernhard (*b.* 1865), historian and critic, born at Vilna, Russia. His chief study is old It. painting. His most notable works are: *Painters of the Renaissance*, 1894; *Florentine Painters of the Renaissance*, 1897; *The Study and Criticism of Italian Art*, 1901; and *Lorenzo Lotto*, 1903.

Beresford, Lord Charles William de la Poer (*b.* 1846), a British naval officer and parliamentarian, son of the fourth Marquis of Waterford, born in co. Waterford, Ireland. He was educated in private schools, and entered the navy as a cadet of the *Britannia* in 1859. He became a lieutenant in 1868, a captain in 1882, and a rear-admiral in 1897. He was naval A.D.C. to the Prince of Wales (King Edward VII.) on his visit to India (1875-6), and to Queen Victoria (1896-7). He was in command of the *Condor* at the bombardment of Alexandria in 1882, when he particularly distinguished himself for bravery; he served in the Nile Expedition under Lord Wolseley, 1884-85; he was in command of the naval brigade at the battles of Abu Klea, Abu Kru, and Metemmeh, and commanded the *Safia* (whose boiler was repaired under fire) in an expedition up the Nile to rescue Sir Charles Wilson's column. He was elected M.P. for Waterford, 1874-80; Marylebone, 1885-9; York, 1897-1900; Woolwich, 1902. He was appointed a Lord Commissioner of the Admiralty, but resigned in two years on a question of the increase of the fleet. In 1898 he visited China as a representative of the Associated British Chambers of Commerce. He was in command of the Mediterranean Fleet, 1905-7, and of the Channel Fleet, 1907-9. He retired in 1911, in which year he was created G.C.B. Since 1910 he has represented Portsmouth in Parliament, and is a vigorous Conservative. He has written numerous articles on Egypt and on naval and imperial quest[illegible] to the *Times*. [illegible]tions are *Nelso* *Break-up of China*, 1899.

Beresford, James (1764-1840), Eng. author, born at Upham, Hants.; educated at Charterhouse and Oxford. In 1812 he became rector of Kelsworth Beauchamp, Leicestershire. His chief work, *The Miseries of Human Life: or the Last Groans of Timothy Testy*, etc., was praised by Scott, and he also pub. some translations and religious books.

Beresford, John (1738-1805), an Irish statesman, born in Dublin and graduated at Trinity College in 1757. He sat in parliament, representing Waterford, from 1760 till his death. He was made Privy Councillor, 1768; First Commissioner of Revenue, 1780; Privy Councillor of England, 1786. B. wielded great authority in Irish affairs and was Pitt's chief adviser in his policy to that country. B. suggested the clauses in Orde's Bill, regarding the removal of the commercial restrictions of Ireland, but was successfully opposed by Grattan. Lord Fitzwilliam dismissed B. from office in 1795, on the ground that his influence in Ireland was displeasing to the Grattan party, and therefore a hindrance to the gov. Fitzwilliam was recalled on this account, and B. reinstated. B. played an important part in bringing about the union of Ireland with England, and superintended the fiscal arrangements between the two countries. His second wife was Barbara Montgomery, one of the 'Graces' of Joshua Reynold's picture in the Royal Academy.

Beresford, Lord John George de la Poer (1773-1862), Primate of all Ireland. He was educated at Eton and Oxford, and was ordained a priest in 1797. He became Dean of St. Macartin's, Clogher, 1799; Bishop of Cork and Ross, 1805; Archbishop of Dublin, 1820; Archbishop of Armagh and Primate of all Ireland, 1822. In 1851 he was elected Chancellor of the Dublin University, having been vice-chancellor since 1829. He was a generous benefactor, and the cathedral of Armagh was restored through his liberality. He died at Auburn, co. Down.

Beresford, Sir John Poo (1766-1844), a British admiral, the natural son of Lord de la Poer, the first Marquis of Waterford. He entered the navy in 1782; in 1795, as acting captain of the frigate *Hussar*, he successfully engaged five Fr. store-ships in Hampton Roads; when in command of the *Raison* he captured a Spanish ship off the Bahamas, 1797. In 1803 he was appointed the command of the North Sea; he served under Lord Gambier during the operations in Basque [illegible]oads, 1809; acted as senior officer the *Poitiers* off Brest, 1810; took part in the blockade of Texel, 1811; promoted to the rank of rear-admiral and created a baronet, 1814; created K.C.B., 1819, and an admiral, 1838. Between 1809 and 1835 he sat in parliament representing successively the constituencies Coleraine, Berwick, Northallerton, and Chatham.

Beresford, William Carr, Viscount (1768-1854), a noted British general, the illegitimate son of the first Marquis of Waterford. He entered the army in 1785 and served with distinction at Toulon, in Egypt, the Cape, and Buenos Ayres. In Feb. 1809 he undertook the reorganisation of the Portuguese army and achieved

great success He was rewarded by being created a K.B. and a peer of Portugal. At Albuera he was in command, and he was also present at Badajoz, Salamanca, and other important Peninsular battles. In 1814 he was made Baron, and in 1823 Viscount, B. He left Portugal in 1819, entered into Eng. politics, and became master-general of ordnance in Wellington's administration, 1828-30. In the latter year he went into retirement and lived in Kent until his death.

Beresina, a riv. in Russia. It is a trib. of the Dnieper, and waters the gov. of Muisk. It is navigable for 250 m., though severe floods mar its value.

Beresna, or Berezna, a tn. of Russia, situated 30 m. E. of Tchernigoff, on a trib. of the Desna; pop. 11,806.

Berezin, Elias Nicolaievitch (1818-96), Russian Orientalist. He travelled through Asia Minor, Persia, Egypt, and Siberia for linguistical and ethological research. In 1855 he was appointed professor of Turkish at St. Petersburg University. He also held the appointment of director of the Oriental Numismatic Museum at St. Petersburg, and largely contributed Oriental subjects to the Russian Encyclopædia.

Berezov, a tn. of Asiatic Russia. It is situated in the gov. of Tobolsk, 700 m. to the N. of that city. From time to time fires have destroyed the tn. Its trade is in furs, mammoth bones, and fish. Pop. 1073.

Berezovsk, a vil. in the gov. of Perm, E. Russia, situated in the Urals, near Ekaterinburg. Centre of important gold-mining dist. of same name, which has been worked since 1747.

Berg, Duchy of, a former duchy of Germany, situated on the r. b. of the Rhine, and having for its boundaries Cleves on the N., La Marck on the E., Westphalia on the S., and Cologne on the W. It became a duchy in 1380, when it was in the hands of the Jülich family. The Thirty Years' War was partly brought about by the question of its successor on the death of John William in 1609. In 1815 the Congress of Vienna made it over to Prussia, though formerly it had been in the possession of Louis, son of the King of Naples.

Berg, a suburb of Stuttgart, cap. of Würtemberg, S. Germany, on the Neckar. Has iron and woollen manufs., mineral springs, and many fine residences.

Berga, a tn. in the prov. of Catalonia, Spain, 52 m. N.N.W. of Barcelona: pop. 5000.

Bergaigne, Abel (1838-88), a Fr. Sanskrit scholar and philologist, born at Vimy, Pas-de-Calais. He became professor of Sanskrit at the Sorbonne, and won a high reputation as a scholar. He wrote voluminously, and issued several translations from the Sanskrit. The following of his works may be mentioned: *La Religion Védique*, 3 vols., Paris, 1878-83; *Chronologie de l'Ancien Royaume Khmér*, 1884; and *Etudes sur le Lexique du Rig-Veda*, 1885. *See* V. Henry, *L'œuvre d'Abel Bergaigne.*

Bergama (anct. Pergamos), a city of Asia Minor about 40 m. N. of Smyrna. Beautifully situated in a fertile valley. Pop. 6000.

Bergamo, a city and episcopal see of Lombardy, Italy. It is the cap. of the prov. of the same name, and is situated at the base of the Alps at the junction of the Brembo and Serio. There are two distinct parts to the tn., the old, Città Alta, on a hill, and Città Bassa below. There are a number of silk and cotton factories and a large cattle market. Pop. (tn.) 25,425, (dist.) 46,861.

Bergamot, or *Citrus Bergamia*, is a variety of *C. Aurantium*, the orange (*q.v.*).

Bergamot, Essence of, is an essential oil obtained both by pressure and distillation from the rind of the ripe fruit of the B. (*q.v.*). The essence smells of oranges, and is used as a perfume.

Bergara, or Vergara, is a small tn. in the Spanish prov. of Guipûzcoa, one of the Basque provs. It is noted for cotton and linen stuffs. Pop. 9000.

Bergedorf, a tn., free ter. of Hamburg, Germany, on the R. Bille, 10 m. from Hamburg. The dist., known as *die Vierlände*, is very fertile, and is a centre of market gardens for Hamburg and export. Pop. (dist.) 25,000, (tn.) 11,000.

Bergen, a city and seaport of Norway, situated on the W. coast, in lat. 60° 23' N. It lies between Vaagen Harbour and the Puddefiord. The vegetation is unusually prolific for that particular lat., though it is accounted for by the equally unusual rainfall (mean 74 in. annually). The appearance of the tn. is picturesque, amid the beauty of the surrounding scenery. The chief street of the tn. is named Strandgaden. Its principal buildings are the cathedral, a hospital, a diocesan college, an observa- [illegible] ion. The [illegible] nd Johan [illegible] Dahl, and the musical geniuses Ole Bull and Edward Grieg were all born here. Among shipowning centres B. ranks first, though its actual trade is less than that of Christiania. The prin. export is fish and fish products, while the others include butter, copper ore, and hides. Its manufs. are not exten-

sive; among them are paper manuf., pottery, ropes, and tobacco. The tn. was founded in 1070 by *King Olaf* Kyrre. Fire damaged it at different times, and the broad spaces (Almenninge) now met so frequently are arranged to arrest any possible outbreak. Pop. 72,129.

Bergen-op-Zoom, a tn., prov. of N. Brabant, Holland, at the junction of the E. Scheldt and the Zoom. It has large tile and pottery works, and the oyster and anchovy fishery is important. Sugar-beet is a new industry. In the 15th century its cloth trade and fisheries made it an important town. Fortified in 1576, it was unsuccessfully besieged by the Spaniards in 1588, 1605, and 1622. It was more strongly fortified by Coehorn, and was captured by the Fr. in 1745, and again in 1795. Sir Thomas Graham (Lord Lynedoch) failed in the assault on the tn., 1814. The fortifications were destroyed in the 19th century. Pop. 13,663.

Bergenroth, Gustav Adolf (1813-69), Ger. historian, born at *Oletzko*, Prussia; educated at Königsberg University; entered the diplomatic service, which he left after the 1848 revolution. He spent 1850-51 in America, and in 1857 settled down to historical study in England, making a special study of the Tudor period. His chief
State Pa
tions bet
vols.), was pub. during 1862-68.

Bergerac, a tn., Dordogne, France, on the Bordeaux-Cahors line. It is a busy centre of trade, especially in the wine of the dist., and there are tan-
ks, and dis-
n the right
bridged to
urb. The
as checked
nturies by
its adherence to Calvinism, especially after the revocation of the Edict of Nantes. Pop. (tn.) 10,545, (com.) 15,625.

Bergerac, Savinien Cyrano de (1619-55), Fr. author of romances and dramas, son of the Seigneur de Mauvières et de B., served as an officer in the Guards during 1639 and 1640; his enormous nose, his adventures, including a fight with a hundred opponents, and the duels which persisted throughout his life, are recorded by his friend Lebret; he then turned to writing, producing (1654) *Le Pédant joué*, a comedy which influenced Molière, and the tragedy, *Mort d'Agrippine*, which the orthodox suspected of atheism. His satirical scientific romances, *L'Histoires Comiques des états de la lune*, 1654, and *Du Soleil*, 1662 have been regarded as the forerunners of Swift's *Gulliver's Travels*, or as merely an echo of Rabelais' *Pantagruel*. He died from an accident while in the service of the Duc d'Aparjon. Edmond Rostand founded his play, *Cyrano de Bergerac*, 1897, on the adventures of the real Cyrano; the central character being played by Coquelin aîné. The collected works were pub. by P. L. Jacob, 1858, with Lebret's memoirs. *See also* P. A. Brun, *1894*, and Garnet Smith in *Cornhill Magazine*, July 1898.

Bergh, Johan Edvard (1828-80), a Swedish painter, born in Stockholm, and father of the modern school. He studied painting at the Rhineland Academy in Paris, and in Geneva, under *Calame*. His paintings are chiefly landscape, and are idealistic in character. He preferred vivid, lively colouring. In 1861 he was appointed professor in the Academy of Stockholm. His best picture is perhaps his 'View of Uri,' now in the Berlin Academy.

Berghaus, Heinrich (1797-1884), a Ger. geographer and cartographer, born at Cleves. He was a member of the Prussian survey of 1816, and was head of a geographical school at Potsdam and professor of mathematics in Berlin. In addition to many valuable
e.g. Grundriss
his chief work
alischer Atlas,
by his nephew
Both uncle an
largely to the
in various editions.

Berghem, Nicholas, *see* BERCHEM.

Bergk, Theodor (1812-81), a Ger. classical scholar, born at Leipzig; was professor of classical literature at Marburg, Freiburg, and Halle from 1842-68, when he retired to Bonn. His chief works are his ed. of the Gk. lyric poets (*Poetæ Lyrici Græci*, 1843, new ed. 1900), of Anacreon, 1834, and a lyrical anthology. His *History of Greek Literature*, begun in 1872, was completed by G. Heinrichs and E. Peppmüller. *See* Peppmüller's memoir in ed. of his minor writings, 1884, and Sandys, *History of Classical Scholarship*, iii., 1908.

[illegible] Joseph (1752-1809), historic

Knoller, Mengs, Canova; obtained the prize at the Academy of Parma, 1784, with a picture of Samson delivered to the Philistines by Dalilah. Returned to Germany, 1786, and painted many altar-pieces for churches in the neighbourhood of Passau; 1800 made director of the Academy at Prague, and painted sev. altar-pieces for churches there; died at Prague.

Bergman, Torbern Olof (1735-84), Swedish chemist, born at Catharinberg, in W. Gothland; educated for church, but devoted his time to mathematics and physics; in 1767 appointed professor of chemistry at Upsala. His writings have been collected in six octavo vols. *Opuscula Torberni Bergman Physica et Chemica.*

Bergmann, Ernest von (1836-1907), Ger. surgeon, born at Rügen, Livonia, Russia. He studied at the Dorpat, Vienna, and Berlin universities, and in 1866 was attached to Prussian troops in the hospital service through the Bohemian campaign and the Franco-Prussian War, and was appointed professor of surgery at Dorpat, 1871-8. From 1878 to 1882 he was professor at Würzburg, and then occupied the chair of surgery in the university of Berlin. In 1887 he attended the Crown Prince of Germany, afterwards Emperor Frederick III., who was attacked with cancer of the throat; this case gave rise to a heated controversy due to the different diagnosis of his colleague in attendance, the Eng. specialist, Sir Morell Mackenzie. B. wrote numerous treatises, including *Zur Lehre von der Fettembolie*, 1863; *Die Lehre von den* [illegible]; and *Die* [illegible] *von Hirn-*

Bergmehl, or Mountain-flour, a geological deposit in the form of very fine greyish-white powder, also called 'fossil farina,' and 'diatomaceous or infusorial earth.' It is largely composed of the indestructible siliceous frustules or cell-walls of diatoms. Beds of earth of considerable thickness that have accumulated in past geological ages are now being found on the bottom of some fresh-water lakes and on the sea-floor. B. has valuable abrasive properties. It is employed in manufacturing dynamite as an absorbent; and is used as insulating material for boilers and steam-pipe coverings. Deposits abound in Tertiary and Quaternary formations of many countries. It has been mined both in Eastern and Western U.S.A. In Lapland and Sweden in times of great scarcity it is sometimes eaten mixed with ground corn and birch-bark. The name is also given to a white powdery variety of calcite resembling cotton.

Bergschrund, a big crevasse at the base of a snow or ice slope. Bs. are usually too wide to be strided, and resort must be had to a snow-bridge.

Bergson, Henri Louis, Fr. philosopher, born 1859 in Paris, and educated at the Lycée Condorcet and the Ecole Normale. He became professor of philosophy at the Lycée d'Angers, 1881-3, and, after holding various posts of a similar kind in the provs., he was appointed professor at the Ecole Normale Supérieure, 1897-1900, and since 1900 has been professor at the Collège de France. He is a member of the Institut and officier de l'Instruction Publique. One of Mons. B.'s most fruitful philosophical theses is, that much of the confusion in early metaphysics arises from the fact that, consciously or unconsciously, we have stated reality in terms of *space* and tried to eliminate *time*. This attempted elimination of time is, he asserts, characteristic only of knowledge dominated entirely by conceptions of utility. If we try to state the relation between knowledge and its objects in terms of time instead of space many antinomies, *e.g.* those of Idealism and Realism, will be resolved. Thus in his *Time and Free Will* he states that determinists and their opponents confuse duration with extensity, and that once this confusion is dispelled we may perhaps witness the disappearance of the objections raised against Free Will. Throughout his work, and particularly in what is perhaps his most important and suggestive book, *Creative Evolution*, Mons. B. insists on the distinction between the nature of our experience of time and our experience of space. Time is a process of change in which none of the parts are external to one another, but interpenetrating, where the past is carried on into the present, where therefore there is no repetition, but a continual creation of what is new. Space, on the other hand, is that whose parts are external to one another; can be simultaneously apprehended, and in which recurrence of the same thing in the same position is possible. Like that shadowy giant of the ancient philosophers, Heraclitus, Mons. B. regards everything as in a state of flux, ceaseless change in which there is, strictly speaking, no repetition or recurrence. Being no recurrence there cannot well be any guiding rules of conduct to meet each new and unique contingency. For this reason Mons. B. has been called a pragmatist, and much of his work consists in insisting on the influence of practical considerations on thought. It is not without interest to record that Mons. Georges Sorel and other syndicalist leaders of the Fr. proletariat find, or profess to find, in Mons. B.'s writings much justification of their ideals and methods. Mons. B.'s lectures have been enthusiastically received by London as well as Parisian audiences, and numerous criticisms of his philosophy have been written within the last few years. His chief publications are *Essai sur les données immédiates*

de la Conscience, 1889 (Eng. translation, 1910); *Matière et mémoire*, 1896 (Eng. translation, 1911); *Le Rire*, 1900 (Eng. translation, 1911); *L'Evolution Créatrice*, 1907 (Eng. translation, 1911). Consult Professor William James, *A Pluralistic Universe*, 1909; *The Philosophy of Bergson*, by A. D. Lindsay, 1911; W. H. Carr, *Henri Bergson: the Philosophy of Change*, 1912; E. Hermann, *Eucken and Bergson*, 1912; Hugh S. Elliot, *Modern Science and the Illusions of Professor Bergson;* and article by the Right Hon. A. J. Balfour in *Hibbert Journal*, 1911.

Bergues, a tn. of N. France, in the Nord dept., 5 m. S.S.E. of Dunkirk. Its industries include brewing, malting, brush-making, and oil preparing. Pop. 4409.

Bergün, a picturesquely-situated vil. and health resort in the Swiss canton of the Grisons near the Albula Pass. It is about 20 m. by road from Thusis.

Berg Wind, the name applied in the S. coast of Cape Colony to a rough, hot, dry northerly wind. This wind is frequent during the months of May and August Its duration is normally one day, but occasionally it blows steadily for two days.

Bergyit, or Berguylt (Norwegian *berggylta*), European name for the rosefish, or *Sebastes marinus*, a fish of the family Scorpænidæ (with 15 dorsal spines and 31 vertebræ). It is found on both shores of the N. Atlantic, and is known by many names, amongst them being Norwegian haddock, redfish, hemdurgan, redperch, redsnapper. The grown fish is of a nearly uniform orange-red colour. The same name is used in Scotland for the black goby.

Berhampur: 1. A
dist., Bengal, Britis
shidabad on the
Indian Mutiny bro
old and abandoned town of Cossimbazar is within the boundaries. Pop. 24,397. 2. A tn., Ganjam dist., Madras, British India. The chief industries are silk-weaving and sugar-manufacture. Pop. 25,729.

Beri-beri, a tropical disease, of which the main symptoms are those of peripheral neuritis, beginning with numbness and stiffness in the legs, swellings and puffing of the ankles and face, and paralysis of muscles; in 'wet B.' the puffiness becomes general and dropsical, in 'dry B.' the muscles atrophy, acute breathlessness and heart palpitations follow, with heart failure, collapse and death, or the dropsical condition affects the lungs with fatal effects. The symptoms vary in intensity according to the particular nerves involved in the inflammation. Mortality varies greatly. The disease has been known in the Far E. from very early times, and it is prevalent in low-lying damp places on the coast and near rivers, chiefly in China, Japan, and Malay, in Africa and W. Indies, and in Cuba, Panama, and S. America. It is liable to break out repeatedly in the same buildings and in ships, by which it has been brought to Europe and Australia. No specific cure is known. Its cause has been attributed to some fungoid parasite, possibly absorbed by eating mouldy rice. Epidemics of peripheral neuritis, such as that attributed to arsenic in the glucose used in beer, have close resemblance to B. *See* Sir P. Manson, *Tropical Diseases*, and his article in Allbutt's *System o Medicine*, 1907.

Bering, *see* BEHRING.

Bériot, Charles Auguste (1802-70), a Belgian violinist and composer, *b.* at Louvain; he married Malibran, the famous singer, in 1836; professor in the Conservatory of Music of Paris, 1843; and of Brussels, 1843-52. He wrote a complete manual for the violin, composed seven concertos, and numerous popular pieces. He had two noted pupils, Vieuxtemps and Léonard.

Beris is a genus of dipterous insect of the family Xylophagidæ. The species are small, metallic-coloured flies which frequent the leaves of plants, and the larvæ feed on putrescent wood. *B. clavipes* lays its eggs in the form of a little chain of single oval eggs glued together.

Berislav, or Borislav, a tn. in the gov. of Kherson, Russia, 40 m. E.N.E. of Kherson city. It manufs. candles, and exports corn and timber.

Berja, a tn., Almeria, Spain, near
Adra Lead is mined near; agric.
include wine, oil, and es-
sss, and there are paper and
ton mills. Pop. 13,224.

Berkeley, a tn., Gloucestershire, England; situated in the Vale of B., a rich dairy and pasture country, celebrated for its 'double Gloucester' cheese. The B. Ship Canal admits small vessels to Gloucester from the docks at Sharpness. The church is Early English and Decorated. B. Castle, where Edward II. was murdered, to the S.E., the residence of Lord Fitzhardinge (*see* BERKELEY, family), is one of the finest in England. Dr. Edward Jenner, the discoverer of vaccination, was born and buried here. Cloth was once manufactured. It was a borough in the 13th century, but the corporation was dissolved in 1885. Pop. 774.

Berkeley, a tn., Alameda co., California, U.S.A. It is a popular residential dist. for San Francisco, 7 m.

distant across San Francisco Bay. It is the site of the university of California, estab. 1873, and of numerous denominational theological colleges and seminaries. Pop. 10,700.

Berkeley, the name of an English noble family, whose history centres round the tenure of the great castle at Berkeley, Gloucestershire. A clear descent can be traced to Robert Fitz-Harding, who died in 1170, and was a wealthy citizen of Bristol. Tradition traces his descent from a son of a king of Denmark who came over with the conqueror. In 1155 he obtained a grant from the king of the manor of Berkeley, and a marriage took place between his son Maurice and the older family, descended from the Domesday tenant. Various lords of Berkeley, usually named Thomas or Maurice, played a distinguished part in the military and political annals of the kingdom. On the death of the ninth Earl of Berkeley in 1810, an important and interesting lawsuit took place. In 1796 he had married Mary Cole, by whom he had already several children; to legitimise these children he made a declaration of an earlier marriage; this entry of marriage in a parish register was declared by the House of Lords to have been a forgery. The eldest son, thus declared illegitimate, had been left the castle and estates by will, and now claimed a writ of summons as a baron 'by tenure of the castle of Berkeley,' a claim which was defeated, as it had been declared in 1669 that such baronies by tenure were not to be revived. He was, however, raised to the peerage as Earl Fitzhardinge; his brother succeeding him revived the claim and was made a baron with the title of Fitzhardinge, which still remains, together with the ownership of the castle and Berkeley estates. The Earldom of Berkeley remains in the legitimate branch of the family. There have been many branches of the family, such as the Lords Berkeley of Stratton (1658-1773), with which the philosopher George Berkeley (*q.v.*) is said to have been connected.

Berkeley, George (1685-1753), Irish philosopher and bishop, *b.* near Dysert, near Kilkenny, Ireland, was the son of a relative of Lord Berkeley of Stratton, Irish viceroy, 1670-72; his mother belonged to the same family as General Wolfe. He entered Trinity College, Dublin, 1700, of which he became fellow, 1707. Here the works of Descartes and Newton were read, while Locke's *Essay*, pub. 1690, was already influencing the study of philosophy. The early trend of his mind is shown by his valuable *Commonplace Book*, 1705-6, first pub. in 1871, which gives the first working out of his new principle in philosophy, that matter, substance, and cause have no meaning apart from the conscious spirit; that no object exists apart from mind. In 1709 he pub. *A New Theory of Vision*, followed by a fuller statement, 1710, *Principles of Human Knowledge* In 1711 appeared a *Discourse on Passive Obedience*, and in 1713 Swift introduced him to the court and the intellectual society of London, and a popular exposition of his new theories in the form of *Dialogues between Hylas and Philonous* was published. From 1714-20 he travelled in Europe as chaplain to Lord Peterborough and as tutor to the son of Bishop Ashe. On his return, the disastrous condition of society, due to the collapse of the South Sea Bubble, led to his *Essay towards Preventing the Ruin of Great Britain*, 1721 In 1722 he was made dean of Dromore, and in 1724 dean of Derry. He then embarked on a scheme for the founding a college in the Bermudas, to Ghristianise from there the American continent. Through Walpole he obtained a promised grant of £20,000, and in 1728 he went to Rhode Is., where he lived till 1731, returning when he realised the money promised would not be paid. In 1733 he pub. *Alciphron, or the Minute Philosopher*, a Platonic dialogue on the philosophy of religion, with criticism of the free-thinking of the age. He was made bishop of Cloyne, 1734. He pub. *The Analyst*, 1734, and *Querist*, 1735-7, the last a series of questions on sociology and economics. In 1744 was pub. his last work *Siris*, which nominally dealing with the use of tar-water as a specific in small-pox and other diseases, contains some of his profound metaphysical speculation. In 1752 he resigned his bishopric and moved to Oxford, where he died.

It is not easy to appraise at its true worth the philosophy of Bishop B., but there can be no question of its value as a connecting link between Locke and Kant. B. is the direct successor to Locke, and much of his work consists of attempts to solve the problems that Locke had failed to. The central principle of B.'s philosophy, that the essence of all reality is its being perceived, or in other words, the impossibility of anything existing independently of perception, was, we know, suggested to B.'s mind by an early study of Locke. As for Kant, he himself has left it on record that he was awakened from his 'dogmatic slumber' by Hume's trenchant but not altogether accurate, attack on B. B.'s *New Theory of Vision*, *Principles of Human Knowledge*, and the *Dialogues between Hylas and*

Philonous (Everyman Library, 483), although written before he was thirty, contain, nevertheless, the main exposition of his philosophy. This main principle was, as we have seen, that nothing existed apart from perception, a principle which B. declared to be intuitively obvious and manifest common sense. But the *soi-disant* men of common sense among his contemporaries—including Dr. Johnson —persisted in regarding B.' [illegible] at best, as a subtle me[illegible] paradox, at worst, as an [illegible] sophistry. He was charged with attempting to prove the non-existence of matter, and that everything in the universe was merely ideal. B. protested against this assumption, asserting that everything that is seen, felt, heard, or in any way perceived, is a real being, *i.e.* exists, whilst, on the contrary, a thing which is not perceived cannot be known, and, not being known, cannot exist. The only intelligible cause of all phenomena is a mind. Neither pain nor pleasure exist apart from their being felt. In a famous passage (*Principles*, sec. 6), B. puts his whole teaching into a nutshell: 'Some truths there are so near and obvious that a man need only open his eyes to see them. Such I take this important one to be, viz. that all the choir of heaven and furniture of the earth, in a word, all those bodies which compose the mighty frame of the world, have not any subsistence without a mind—that their *being* is to be perceived or known.' 'But how,' asked Hume, 'can we know that mind? Is it too an idea?' To this B. responds that we have no idea of the self but only a *notion* of it. B., perhaps wisely, never developed this doctrine of notions, for had he done so, and to the extent that he did so, he would have undermined his central doctrine of idealism. Standard ed. of B.'s complete works, A. Campbell Fraser, 1871, new and revised ed., 1901, with Life, Letters, [illegible]

[illegible]

Northamptonshire. He was educated at Rugby and Cambridge. In 1886 he became rector of Sibbertoft. In his botanical researches he specialised in fungi. He was one of the earliest investigators on the potato murrain, on grape mildew, and on diseases of hops, cabbage, onions, tomatoes, etc. His chief works are *Introduction to Cryptogamic Botany*, 1857, and *Outlines of British Fungology*, 1860.

Berkeley Sound, an opening on the N.E. coast of E. Falkland Is., situated in lat. 51° 30′ S., and long. 57° 56′ W.

[illegible] (1730-c.179[illegible]), [illegible]born at Leeds. [illegible]nt. Served in [illegible] 1760 came to Edinburgh, where he pub. a *Botanical Lexicon* explaining terms used by Linnæus and other botanical writers; wrote many books on medicine which were popular in their day, also a [illegible]*ria* (Lives of the [illegible] and Irish Authors). [illegible]eat with the Americans, and on his return was pensioned. His last publication was *Letters on Education*, 1791.

Berkhamstead (Great Berkhamstead), a tn., Hertfordshire, England, 28 m. from London on L. & N.W.R. It is on the Bulborne R., and near the Grand Junction Canal. Straw-plaiting is the chief industry. The important grammar school dates from 1541, and there is a large church, St. Peter's, of many styles and dates, chiefly Perpendicular. There are remains of the once important castle. Pop. 5140.

Berkovitza, a tn., W. Bulgaria, on the Ogost, a trib. of the Danube. It lies 40 m. N.W. of Sofia. Pop. 5500.

Berkshire (A.S. *Berroc-scir*, from the 'wood of Berroc where the box-tree grows'), a southern midland co. of England, lying between Oxford and Bucks, N.; Hampshire, S.; Surrey, E.; and Wiltshire, W. The area is 462,208 ac. Pop. 256,509.

There are three co. parliamentary divs., Abingdon (N. div.), Newbury (S.), and Wokingham (E.). Reading, the co. tn. returns one borough member. The Thames forms the natural northern boundary, on which are situated the old tns. of Abingdon, Wallingford, Maidenhead (now entirely modern), Reading (the only large industrial centre), and Windsor. In the N.W. is the Vale of the White Horse, so called from the rude figure of a horse, 374 ft. long, cut out of the chalk on White Horse Hill (856 ft.). It is probably of far greater antiquity than Alfred's Danish victory it is said to commemorate. Through the rich pastoral vale in which lies Wantage runs the Ock. S. and E. are the [illegible]

[illegible] tn. are on the E. border, and S.E., stretching into Surrey, are the sandy pine-clad heaths of Bagshot, where

are Ascot and Wokingham, near which are the Royal Military College at Sandhurst and Wellington College. The co., except for Reading, is chiefly agricultural, sheep-farming on the chalk Berkshire downs and dairying being of great importance. The Berkshire breed of pigs is famous. *See* E. Ashmole, *Antiquities of Berkshire;* Cooper King, *History of Berkshire;* Vincent, *Highways and Byways in Berkshire; Victoria County History.*

Bêrlad, the cap. tn. of Tutova, Roumania, on the railway from Jassy to Galatz. Pop. 24,484. It has an important annual horse-fair, manufs. soap and candles, and is an agricultural centre for wheat and other products.

Berlengas, a group of small is. in the Atlantic, situated to the W. of Estremadura in Portugal.

Berlichingen, Götz von (16th century), a Ger. knight of Swabia, the subject of Goethe's poem bearing his name (trans. by Sir Walter Scott). Went to war with his neighbours, and in 1513 was put under the ban of the empire for attacking Nürnberg; besieged by Maximilian the Emperor, and died in defence of his castle.

Berlin, the cap. of the kingdom of Prussia, the seat of the Royal and Imperial Palaces, of the Federal Council, Imperial Parliament, the Prussian and of all the gov. offices of the Ger. empire, with the exception of the Supreme Court of Justice (*Reichsgericht*), which is at Leipzig. In commerce, trade, and industry it is one of the most important cities of Europe, and in population ranks third after London and Paris. It is the station of the Guard Army Corps and of the Third Corps. It lies on both sides of the Spree, and by the Spandau and Tetlow canals to the Havel it is linked with the systems of the Oder and the Elbe. It is 84 m. from Stettin and 180 m. from Hamburg, and is the centre of the great Prussian state railway system.

In recent years there has been a remarkable expansion of the suburban dists.; residential sites have sprung up in the pine woods and by the lakes of the Havel to the N.W., and Spandau, Charlottenburg, and Potsdam may almost be regarded as suburbs. In its industries B. is almost as varied as London, but machinery, especially locomotives and electrical, woollens, dyeing, furniture and metal work are the chief. It is beginning to rival Leipzig in book production, and its breweries are large. Besides being the centre of the great trade in corn and other cereals of Eastern Europe, its great banks exercise increasing international influence; and its stock exchange, though hampered by gov. restrictions, does an enormous amount of business. The famous Friedrich Wilhelm University, founded in 1810, now the largest in numbers in Germany, the splendid technical institution at Charlottenburg, and its numerous schools of all ranks make B. one of the greatest intellectual and educational centres of the world. As the seat of the Imperial Court, and of the Imperial Parliament and administration, it is also the social centre of the empire, and its modern wealth and luxury have made it a growing rival to Paris as a city of pleasure. Since 1878 the city has been practically rebuilt; the sudden growth of population has resulted in much overcrowding and crushingly high rentals. Once deplorable, the sanitation, water supply, and public hygiene are now of the highest standard, and Ger. scientific thoroughness has made it the most highly organised and best administered city in the world. Its gov. is partly municipal, including drainage, lighting, etc., water supply, schools, poor law, and hospitals; the city council consists of paid officials (15) and unpaid (17), the common council (144) is elected, presided over by an *Oberbürgermeister* and a *Bürgermeister*. The police authority extends over building, markets, crime, and trade. B. sends six members to the *Reichstag* and nine members to the Prussian *Landtag*.

B. is the junction of twelve main railway lines. The city itself is served by an Outer Circle (*Ringbahn*) and by the *Stadtbahn*, running E. and W. through the city. There are electric tram lines, an overhead electric railway, and a shallow underground railway.

The principal streets are Unter den Linden, leading from the Royal Palace in the Schlossplatz W. to the Brandenburg Gate (built 1789, a copy of the Propylæa at Athens); S. lie the banking street, Behren Strasse, and the Wilhelm Strasse, the official quarter, where is the imperial chancellor's palace. Fine shops and restaurants line the Friedrich Strasse; Viktoria Strasse is one of the many thoroughfares of the fashionable dist., S.W.; König Strasse and Kaiser Wilhelm Strasse are the business streets of the city proper. Outside the Brandenburg Gate lies the Tiergarten, a beautiful park crossed by the Siegesallee (1901), with its marble statues of Hohenzollern rulers, given by the present emperor. The Tempelhofn Feld, to the S., is the parade and review ground of the B. garrison. The Royal Palace, standing in the Schloss-

platz, is one of the few old buildings in B., dating from the 16th century; it contains over 600 rooms, including the great Weisse-Saal and the halls of the Black and Red Eagle orders, etc. Other palaces are those of the Emperor William I. and of Frederick III. The Imperial Parliament House, N. of the Tiergarten, was designed by P. Wallot. The only old churches are the Marien-kirche and Nikolai-kirche. The new cathedral, by J. Raschdorff, was begun in 1893 The most striking bridge is the Schloss-brücke, by F. Schinkel, with
The Opera and
the subsidised
including the Lessing and the Deutsches, where most of the modern plays are produced. No city has so many statues and monuments to the national heroes, kingly or military, or to those famed in literature, science, and art. The Royal Library, once in the palace, is now in a new building, built in 1909 on Unter den Linden; it contains nearly 5,000,000 printed books. The University Library is housed in the same building. There is a large public library and twenty-eight municipal libraries. The Royal Museum, in the Lustgarten, N. of the Schlossplatz, is divided into the Old and the New Museums, containing the treasures of classical and mediæval sculpture, the Egyptian collection, etc. The National Gallery contains the modern Ger. paintings. In the Kaiser Friedrich Museum (1904) is housed
t collection of
bronzes, etc.
2,070,695, but if
greater B. be
included, over 3,000,000.

History.—The nucleus of the town were the two small places of Kölln and B., on the arms of the Spree. Here Frederick II. (the Iron) built a castle, and John (Cicero) made it a court o lectors.
It suffe Thirty
Years' till the
time of the Great Elector and his successor that the towns grew and were consolidated as one under its present name. The end of the Napoleonic wars saw a great rebuilding, inspired by F. Schinkel, but its great rise and its present appearance dates from the formation of the Ger. empire and the consequent centralisation in B. and the enormous expansion of Ger. trade and commerce.

Berlin, a tn., Coos co., New Hampshire, U.S.A.; pop. 11,982. The falls of the Androscoggin riv. provide the power for the large pulp, paper, fibre, and saw mills.

Berlin, a tn., Waterloo co., Ontario, Canada; pop. 9747. It is on the Grand Trunk Railway, 58 m. W. of Toronto. It has large furniture, leather, and other manufactories.

Berlin, Congress and Treaty of (June 1878), a convention of the representatives of the chief European powers called by Prince Bismarck. The object of the treaty was the reconstruction of the Russo-Turkish treaty of San Stefano (1878). The congress met under the presidency of Prince Bismarck at B. Great Britain was represented by Lord Beaconsfield, Lord Salisbury, and Lord Odo Russell. By the treaty Roumania, Servia, and Montenegro were recognised as independent states. The boundaries of Bulgaria were enlarged, and it became an autonomous Turkish tributary state under an elected prince. Roumelia also became self-governing, under a Christian minister in chief, but was still held under the power of the Sultan. The boundaries of Greece were also enlarged. Bosnia and Herzegovina were transferred to the control of Austria. Roumania obtained the Dobrudja, and in return ceded to Russia the Bessarabian ter. she took from Russia at the treaty of Paris. Ardahan, Kars, and Batum were ceded to Russia. The treaty of B. consisted in all of sixty-four articles.

Berlin Spirit, a potable spirit distilled from comparatively inexpensive material, such as potatoes and beetroot. It contains a large proportion of deleterious by-products, and is used for adulterating brandy and fortifying wines of poor quality.

Berlioz, Hector (1803-69), Fr. musical composer, born near Grenoble, the son of a doctor, was trained for that profession but broke with his family, and after many difficulties entered the Conservatoire. He gained the Prix de Rome in 1830 with a cantata, *Sardanapalus*. His marriage (1833) with the Shakespearian Irish actress, Harriet Smithson, was unhappy, and they separated in 1840. During this period he wrote the dramatic symphonies, *Episode de la vie d'un Artiste; Harold en Italie; Symphonie Funèbre et Triomphale*, which contains a magnificent march for a military band; and *Roméo et Juliette*. From 1838-64 he was musical critic for the *Journal des Débats*. His opera *Benvenuto Cellini* was refused a hearing in Paris, 1837. In 1846 he produced his greatest work, the symphonic cantata *La Damnation de Faust*. His sacred works include the requiem, *Grand Messe des Morts*, 1837; *Te Deum*, 1855; and the trilogy, *L'Enfance du Christ*, 1855. His last works were *Béatrice et Bénédict*, 1861, and *Les Troyens*, 1863. In 1842 he had first visited Germany, where, owing to Schumann's praise in the *Neue Zeitschrift für Musik*, he was

received with enthusiasm by the new school, as he was later in Vienna and St. Petersburg. He died in Paris. B. was one of the principal exponents of modern 'programmic' music, but his fame will rest chiefly on his wonderful and original mastery of orchestration, in which his fervid and romantic imagination found full scope. His *Traité d'instrumentation*, 1844, has been ed. with additions by Richard Strauss, 1906. His *Memoirs* and *Letters* were pub. in 1870 and 1882; *see* selections, Eng. translation, in Dent's 'Everyman Library.' *See also* Julien's *Life*, 1888; Filson Young, *Master Singers*, 1908; Hadow, *Studies in Modern Music*, first series, 1908; new ed. of complete works, Breitkopf and Härtel.

Berme (Ger. *berme*, the edge of a field) is a technical term of fortification, both temporary and permanent. In the former kind of fortification it is the name given to an earthen mass which separates the parapet from the ditch, and whose function is to uphold the weight of the parapet in order to prevent it from causing the earth of the scarp to fall in. In permanent fortification the B. is a block of freestone which crowns the scarp, and projecting slightly over the ditch, serves substantially the same function as the temporary B. When public works are in course of construction, the narrow passage between the canal or ditch, and the earth which is excavated therefrom, is called a berme.

Bermejo, Rio, a riv. of Argentine Republic, rising on Bolivian frontier and flowing S.E. into the R. Parana. Much of its course is navigable by shallow-draught vessels. Total length over 1000 m.

Bermeo, seaport of Vizcaya, Spain, on Bay of Biscay, 14 m. N.E. Bilbao. Pop. 8400.

Bermondsey, a metropolitan bor. of the S.E. dist. of London, on the S. side of the Thames. Rotherhithe and part of B. form the B. div. of the parl. bor. of Southwark. The prin. industry, long established, is that of leather, but the Surrey Docks and riv. wharves employ a large amount of labour. Nothing now remains of the Clunial abbey, 1399. Pop. 130,760.

Bermudas, a group of small is. in the W. Atlantic Ocean, 32° 15′ N. and 64° 51′ W., 580 m. off Cape Hatteras, the nearest point on the N. American coast. They are named after a Spaniard, Juan Bermudes, shipwrecked here in 1527. Sir George Somers was also wrecked in 1609, and they were finally settled in 1612, since when they have belonged to the British empire. Geologically they are formed of acolian limestone deposits and coral reefs, being the northern limit of the coral builders. There are some 100 is., of which all but fifteen are small, uninhabited rocks, forming an oval ring, lying N.E. to S.W. The total area is 20 sq. m. Great Bermuda, the Main Is., 14 m. long, contains the cap., Hamilton (pop. 2627); the only other tn. is St. George (pop. 1000), on that is., which, with Paget, Smith, and other is., encircles Carth Harbour, N.E. of the Main Is. At St. George is the great floating dock, 545 ft. by 100 ft., towed out in 1902 to replace the earlier one of 1869. The islets of Ireland, where is the naval station, Somerset, etc., enclose the Great Sound at S.W. of Main Is. The temperate climate, 87-49°, makes the B. a popular winter resort for Americans, and there is considerable export trade in early vegetables and spring flowers to the United States. On account of the strategic position of the group there is a military garrison and a naval dockyard and station. The pop., excluding army and navy, is 19,000, 6691 being white. The is. are a British crown colony, administered by the governor and commander-in-chief, an Executive Council (6), Legislative Council (9), both appointed by the crown, and House of Assembly (36), elected by the nine parishes, four members each. The B. are included in the diocese of Newfoundland. The revenue amounts to £78,500, expenditure £68,000: exports £130,000, imports £500,000. *See* Heilprin, *Bermuda Islands*, 1889; Stark, *Bermuda Guide*, 1898; Cole, *Bermuda*, with bibliography, 1907.

Bermudez, a state in Venezuela, S. America, with an area of about 32,244 sq. m. It extends from the Caribbean Sea to the Orinoco, and to the Punta de Paria and the delta of the Orinoco. Barcelona is the capital.

Bern, or Berne, the most populous and, with the exception of Grisons, the most extensive canton of Switzerland, has an area of 2650 sq. m. The fertile valleys of the Aar and the Emmen divide the mountainous alpine region in the S. from the Jura Mts. in the N. Among the peaks of the Oberland are the Jungfrau, the Shreckhorn, the Erger, etc.; among the lakes of the canton are those of Thun, Neuchâtel, and Bienne. The prin. riv. is the Aar. The northern part of the canton is hilly; it has a fertile soil which produces corn, wine, and fruits. The south-eastern part, the Oberland, produces fruits in its lower valleys, and excellent pasturage higher up. Cows and horses are reared, the horses of Emmenthal especially being noted; the lakes abound in salmon and trout. Many quarries of sandstone, granite, and

marble are worked, and iron mines, whilst a little gold is also found. The manufs. of the canton, which are not extensive, comprise linen and woollen goods, leather, wood articles, and watches. The canton, which is made up entirely of lands acquired by the city B. at various times, has a pop. of 600,000.

B., the cap. of the canton, and political cap. of the Swiss confederation, is situated on a high sandstone promontory, surrounded on three sides by the R. Aar; it is 68 m. S.S.W. of Basel. It is the finest town in Switzerland, and one of the best-built towns in Europe. There is a magnificent Gothic cathedral, dating from the 15th century; a university, a Federal Council Hall, a museum, public library, etc. B. has not many manufs., chiefly dress fabrics and hats; it has however a very considerable trade with the dist. B. was founded in 1191, and became a free imperial city in 1218, and gradually attained a state of independence. Between 1288 and 1339 it successfully resisted attacks by Rudolph of Hapsburg, Albert his son, and Louis of Bavaria. In 1405 much of the city was destroyed by fire, but was afterwards rebuilt. In 1528 B. embraced the cause of the Reformation, and in the ensuing war with the Duke of Savoy added the Pays de Vaud to its dominions. From then till 1798 B. continued to prosper; in the latter year it opened its gates to the Fr. troops, and lost about half its possessions. The origin of the name of the town is said to be from old Swabian 'bern,' meaning a bear, and certainly a bear is represented on the first known tn. seal, of the date 1224. Ever since 1513 bears have been kept in B. at the public expense, and the bear-pit is still one of the sights of the town.

Bern Convention, *see* COPYRIGHT.

Bernadotte, *see* CHARLES XIV. OF SWEDEN.

Bernalda, a tn in the prov. of *Potenza, Italy*. It is about 35 m. S.W. of Tarantò. Pop. 7000.

Bernard (*fl.* 865), a traveller in Palestine, called 'Sapiens,' who has been confused with a Scottish monk of the same name. He set out from Rome, between 863 and 867, to Palestine, and on his return went to the monastery of Mont St. Michel, in Brittany. To him has been attributed a work, *De Ipsa Urbe Hierusalem et de multic adjacentibus Locis*, and also a short tract, of which a manuscript exists at Oxford and another in the British Museum. Consult *Early Travels in Palestine* (Bohn's Antiquarian Library, 1847), and Mabillon, in Migne, *Patrologiæ*, 1857-66.

Bernard, Claude (1813-78), a Fr. physiologist, born near Villefranche, began the study of medicine in 1834 and worked with the great Majendie at the Collège de France, becoming deputy professor in 1847, and succeeding him the chair, 1855. His laboratory work and his experiments on animals rank him among the greatest physiologists of his time; his prin. researches and discoveries were in the digestive function of the pancreas, the sugar-making (glycogenic) secretion of the liver, and, perhaps his most epoch-making, the discovery of the vaso-motor system. His study of the action of poisonous drugs, chiefly curare, is also of high importance. He pub. *Introduction à la Médicine Experimentale*, 1885; *Physiologie générale*, 1872; but his work is best judged by the 17 vols. of his lectures (*Leçons*); *see* his *Life* by Sir M. Foster, 1899.

Bernard, Edward (1638-97), oriental scholar and mathematician, born at Towcester, Northamptonshire; 1655 elected scholar of St. John's College, Oxford; studied Hebrew, Syriac, Arabic, and Coptic; 1669 Christopher Wren, appointed architect to the king, appointed B. his deputy to the Savilian chair of astronomy. B. supervised the reprinting of the old mathematicians; he was more versed in the antiquarian learning connected with astronomy than with astronomy itself. He died at Oxford.

Bernard, Mountague (1820-82), an eminent Eng. lawyer, *b.* at Tibberton Court, Gloucestershire. He studied at Trinity College, Oxford, of which he became a Vinerian scholar and fellow; he was called to the bar at Lincoln's Inn, 1846. He was influenced by the High Church movement, and became one of the founders of *The Guardian*, 1846. He was appointed the first professor of international law at Oxford, 1859-1874; and was elected a member of the commission on naturalisation and allegiance, 1868. In 1871 he went to America, and was one of the high commissioners who signed the Treaty of Washington, and on his return was made a privy councillor. He became a member of the University of Oxford Commission, and joined the Institut de Droit International at its foundation in 1873. He wrote voluminously on legal and diplomatic questions.

Bernard, William Bayle (1807-75), Eng. dramatist, *b.* at Boston, U.S.A.; returned to England in 1820; was clerk in the Army Accounts Office, 1826-30, later becoming a professional dramatist. His plays include: *The Pilot*, 1827; *Rip Van Winkle*, 1832; *The Nervous Man*, 1833; *The Man About Town*, 1836; *Marie Dun-*

cange, 1837; *His Last Legs*, 1839; *The Boarding School*, 1841; and *The Round of Wrong*, 1846.

Bernard of Morlaix, a Fr. monk of the 12th century, who belonged to the Benedictine order. He was the author of *De Contemptu Mundi*, a poem, which was published at Paris in 1843. It was complete in three vols., each containing 1000 verses, and has been widely read in a translation by Neale.

Bernard, St., the name of two passes across the Alps. The Great St. Bernard (8111 ft. high, 53 m. long) leads from Martigny, in Valais, Switzerland, to Aosta in Italy, across the Pennine Alps. The Little St. Bernard (7179 ft. high, 39 m. long), from the Isere valley, Savoy, France, to Aosta across the Graian Alps. The first pass, Alpis Poenina, seems to have been opened in 57 B.C. by Servius Galba for Julius Cæsar, but the road, of which there are slight remains, was not made till much later. It was in existence by A.D. 69. At the top of the pass was a temple to Jupiter. The famous hospice was founded by St. Bernard of Meuthon (died *c.* 1081) and has been served by Austin Canons since the end of the 12th century. The monks' service in saving life, with the aid of their dogs, has become historical. (For the St. Bernard breed of dog, *see* DOG). Napoleon and his army crossed the Great St. Bernard in 1800. The construction of a carriage-road was not finished till 1905. The Little St. Bernard, known to the Romans as Alpis Graia, was the chief pass till the opening of the pass at Mont Genèvre, Alpis Cottia, 75 B.C., and the road in A.D. 3; traces of the Roman road still remain. Hannibal's crossing the Alps by this pass is still disputed. The hospice was also founded by St. Bernard.

Bernard, St., of Clairvaux (1090-

mother was of a noble Burgundian family. He joined the newly founded monastery of Citeaux, and in 1115 founded the daughter house of Clairvaux, of which he was the first abbot. His saintly and ascetic life, his marvellous preaching and his reforming zeal made him the most influential churchman of his time, and the abbey the most important of Cistercian monasteries, from which during his life sprang some ninety other houses In 1127 his great influence deserved the success of the newly formed order of Knight's Templars whose rule he inspired if he did not actually draft. From 1130-8 he played the chief part in establishing Innocent II. in the papacy as against the anti-pope Anacletus, and thus ended the schism which threatened the church. The elevation of his pupil, Eugenius III., to the papacy in 1145 made him almost a second pope. He presided at the condemnation of Abelard at Sens, and of Gilbert of Poitiers at Reims, and by his preaching checked the spreading heresies in Languedoc. As preacher of the second crusade in 1146 he won Louis VII. of France and Conrad of Germany to take the cross. The disastrous ending shook his power, and his failing health and the call of his order prevented his undertaking the third crusade. He died at Clairvaux, 1153, and was canonised by Alexander III., 1173. St. B. is one of the great figures of mediæval Christendom; apart from his political influence, the magnetic power of his preaching, and the example of his ascetic life, he stands out as the type of the practical mystic as opposed to the subtleties of scholastic theology. His voluminous writings include letters, sermons, and dogmatic and mystical treatises; some of his hymns are still used in Protestant churches. Complete works first pub. 1508; ed. by Mabillon, 1667; Eng. trans. Eales, 1889-95; see also J. C. Morison, 1863, S. J. Eales, 1890, E. Vacaudard, 1895, R. S. Storrs, 1893, and D'Haussonville, 1906.

Bernard-Beere, Mrs. Fanny Mary (*b.* 1859), Eng. actress, *b.* at Norwich, the daughter of Mr. Wilby Whitehead; prepared for the stage by Hermann Vezin; first appeared at the Opéra Comique. Married (1) Capt. E. C. Deering, (2) Bernard-Beere, (3) A. C. S. Olivier. In 1877 she joined the St. James's company, London, taking the parts of Julia in *The Rivals*, Lady Sneerwell in *The School for Scandal*, Emilia in *Othello*, and Grace Harkaway in *London Assurance*. In 1879 she appeared at the Olympic as Gretchen in Gibert's *Faust*, in 1880 at the Adelphi in *The Green Bushes*, and at the same theatre the next year in *Michael Strogoff*, and in 1881 at the Court in *Mimi* and *Adrienne Lecouvreur*. In 1882, at the Globe, she played in *Far from the Madding Crowd*, *Jane Eyre*, and *The Promise of May*, and was engaged in 1883 by the Bancrofts for Sardou's *Fédora*, in which she scored a great success. In 1887 she became manager at the Opéra Comique, and produced *As in a Looking-Glass*, *Ariane*, and *Masks and Faces*. She appeared at the Criterion in *Still Waters Run Deep*, and at the Garrick in *La Tosca* in 1889, and toured in America and Australia during 1892-3. In 1897 she appeared at the Comedy in *A Wolf*

in Sheep's Clothing, at Wyndham's in *The End of a Story* in 1902, and at the Coliseum in *The Spy* in 1905.

Bernardin de Saint-Pierre (1737-1814), Fr. author and engineer, born at Havre; educated at Caen; became an engineer and entered the army, but was dismissed and travelled about over Europe till 1765, when he settled in Paris. During 1768-71 he filled a gov. post at Ile de France. In 1792 he became superintendent of the Botanical Gardens in Paris, in 1794 professor of morals at the Normal School, and in 1795 a member of the Institute. His work, which is largely influenced by Rousseau, and deals almost entirely with sentimental and imaginative themes, has had a great influence on Fr. prose style. His best known books are: *Voyage à l'Ile de France*, 1773; *Etudes de la Nature*, 1783-8; *Paul et Virginie*, 1787; *La Chaumière Indienne*, 1791; and *Harmonies de la Nature* (pub. posthumously). His works and correspondence were collected with a Life by Aimé Martin, 1818-20. See also biographies and critical studies by Lescure, Maury, and Arvède Barine.

Bernardines is a name which is sometimes used as a synonym for Cistercians, the order of monks founded by St. Bernard. Originally the name was generally used of the Cistercians of the Clairvaux branch of the order. For fuller particulars, *see* CISTERCIANS.

Bernardino of Siena, Saint (1380-1444), It. Franciscan friar, *b.* at Massa di Carrara. Entered Franciscan Order, 1404; appointed vicar-general, 1438. He restored the strictness of the early monastic rule, was famed as a preacher and wrote several mystic works. He founded the 'Fratres de Observantia,' a branch of the Franciscan Order, numbering over three hundred monasteries in Italy in his own time. B. was canonised as a saint, 1450. His writings were pub. in Venice, *c.* 1594, again in 1745, and in Paris in 1636. Consult Toussaint, *Das Leben des heiligen Bernhard* (Regensburg), 1873; Mary Allies, *Three Catholic Reformers*, 1879.

Bernau, a tn. of Brandenburg, Prussia, 13 m. N.E. of Berlin. It has woollen, cotton, and silk weaving industries. Pop. (1900) 8348.

Bernauer, Agnes, the daughter of a poor barber-surgeon of Augsburg, was married secretly to Albert, eldest son of Ernest, Duke of Bavaria, Munich, in 1432; banned from a tournament by his father for his apparent illegal connection with Agnes, Albert openly acknowledged her as his wife, but in his absence she was charged with witchcraft, condemned, and drowned in the Danube. One of C. F. Hebbel's prin. tragedies, *Agnes Bernauer*, 1855, is based on the story, and Otto Ludwig left an unfinished play on the same subject.

Bernay, a tn., dept. of Eure, France, on the Charentonne, on the Western Railway, 31 m. from Evreux; pop. 5973. A great fair for Normandy horses is held annually, and there are cotton manufactories, and bleaching and dye-works. The abbey, round which the town grew, was founded in the 11th century. Its buildings are used for civic purposes.

Bernays, Jakob (1824-81), German-Jewish philologist, born in Hamburg, educated at the university of Bonn, where he became librarian and professor in 1866. His works, dealing with classical philology and Greek philosophy, were ed. by Usener and pub. at Berlin in 1885. His most important book is an ed. of Lucretius, 1856.

Bernays, Lewis Adolphus (1831-1908), Australian scientist, born and educated in London, subsequently emigrating. He was an officer of the New South Wales parliament during 1853-9, and after 1860 clerk of the Queensland Legislative Assembly. He founded the Queensland Acclimatisation Society, and pub. sev. works on economic botany.

Bernburg, a tn., Anhalt, Germany, till 1865 cap. of the duchy of Anhalt-B. Pop. 34,929. In the Bergstadt, on r. b. of the Saale, is the old ducal castle. Machinery and boiler-making, pottery and chemical works are the chief industries.

Berners, John Bourchier, Lord (1467-1553), translator, son of Sir Humphrey B. (a descendant of Edward III.), who was killed at the battle of Barnet, fighting for Edward IV. John was sent to Oxford at an early age, and became later a great favourite of Henry VIII., who made him Chancellor of the Exchequer for life; he was made governor of Calais, where he died. At the king's command he translated the *Chronicle of Froissart*, 1523-5, the work being printed by Pynson; *The Golden Book of Marcus Aurelius*, 1534; *History of Arthur of Lytell Brytaine* (Brittany); and the *Romance of Huon of Bordeaux*. He also wrote a comedy called *Ite in Vineam meum* ('Go to my vineyard'), which was acted in the great church of Calais after vespers. *See* Walpole's *Royal and Noble Authors*.

Berners, or Barnes, Juliana (*b.* 1388, ? 83), is the reputed author of the *Boke of St. Albans*, a treatise on hawking and hunting. The first eds., of
in
profess
Albans. Having passed her girlhood

at court, she must have retained her love of field sport, after entering the convent. John Haslewood, who pub. a facsimile of the work in 1811, claims that she is the earliest Eng. author of her sex.

Bernese Oberland, strictly the upper country or 'highlands' in the S. of the Canton of Berne, Switzerland, but often extended to include the range of the Alps from the upper Rhone valley northwards, and from the Lake of Geneva to the Lake of Lucerne, thus lying also in parts of Valais, Vaud, Fribourg, Lucerne, Uri, and Untervalden. It is the most frequented of Alpine dists. by tourists and visitors, not only in the summer but also in the winter. The chief centres from which expeditions are made are: Thun, the cap. of the B.O., which formed a separate canton of the Helvetic Republic, 1798-1802; Interlaken, 17 *m.* by rail from Thun; Schynige, Platte, Lauterbrunnen, and Grindelwald, one of the most frequented resorts in Switzerland; Meiringen, the meeting place of many routes; Mürren and Kandersteg. The principal peaks of the B. O. are the Finsteraarhorn, 14,096 ft.; the Aletschhorn, 13,721; the Jungfrau, 13,669; the splendid view from Interlaken is famous, Mönch, 13,168; Gross Schreckhorn 13,386; Gross Viescherhorn, 13,285; Eiger, 13,042; the three peaks of the Wetterhorn, 12,166, 12,149, and 12,110. The views from the Sparrhorn, 9928, Eggishorn, 9626, are well known. The highest passes are Lauithor, 12,140, Mönchjoch, 11,680, and Jungfraujoch, 11,385, leading to the Eggishorn from Lauterbrunnen, Grindelwald, and the Wengorn Alp respectively. The Gemmi, 7641, leads from Kandersteg to Leukerbad, the Grimsel, 7100, with a carriage-road, from Meisingen to the Rhone Glacier, and the Great and Little Scheidegg, 6434 and 6772, from Grindelwald to Meisingen and Lauterbrunnen. The three largest glaciers in the Alps are in the B. O., viz. the Great Aletsch, 16½ m., the Unteraar, and the Fiescher, 10 m.

Bernesque Poetry, a type of verse in which the thought is a combination of satirical wit, raillery, and philosophy. The name is taken from the work of Francesco Berni (1497-1535), and modern examples of the school are Byron's *Don Juan* and Ibsen's *Peer Gynt*.

Bernhard of Saxe-Weimar, Duke (1604-39), one of the great Protestant generals of the Thirty Years' War, was the youngest son of John, third Duke of Saxe-Weimar. At the beginning of the war he was present at the defeats of Wieslock, Wimpfen, and Stadtlohn, 1622-23. He joined Christian IV.'s Danish army in 1625 and later rose to high rank in the army of Gustavus Adolphus. His splendid leadership in command at Lützen, 1632, after Gustavus's death, and his successful invasions into Germany and Bavaria made him the most formidable opponent of the Imperialists. In 1633 he captured Regensburg, but was crushingly defeated by Gallas at Nördlingen in 1634. On the entry of France into the war he took service with her, still being general in command of the Protestant forces. His campaign of 1638 was successful with victories at Rheinfelden, Wittenweiher, and Thaun, and the capture of one of the strongest fortresses in Europe, Breisach. He died at Breisach the following year. See *Lives* by Rose, 1828, and Droysen, 1885.

Bernhardi, Theodor von (1802-87), a Ger. historian and diplomatist, born in Berlin, and died at Hirschberg, Silesia. In 1865 he entered the Prussian diplomatic service; he was, at first, secretary to the legation at Florence, and between 1866 and 1871 was Prussian ambassador at Lisbon and Madrid. He wrote on historical subjects, his works including *Denkwürdigkeiten aus dem Leben des Russischen Generals Karl Friedrich von Toll*, 1856-8, and *Geschichte Russlands und der Europäischen Politik in den Jahren*, 1814-31, 3 vols., 1863-77.

Bernhardt, Sarah, Fr. actress, was born in Paris, 1845, of a Jewish family named Bernard; she was baptised with the name of Rosine and was brought up in a convent; after gaining prizes for tragedy and comedy at the Conservatoire she appeared in a small part in Racine's *Iphigénie* at the Comédie Française in 1862; in 1867 she joined the Odéon company and made her first marked successes as Zanetta in Coppée's *Le Passant*, 1869, and as the Queen in Hugo's *Ruy Blas*. Returning to the Française after the war, her great performances in the title rôle of Racine's *Phèdre* (1874), the test part of Fr. tragedy, and as Doña Sol in Hugo's *Hernani* (1877), proclaimed her as the successor to Rachel's vacant place on the Fr. stage. In 1880 she broke with the Comédie Française on the production of Angier's *Les Aventuriers* and had to pay heavy damages. She began her triumphal tours of the world, appearing principally in Scribe's *Adrienne Lecouvreur*, Dumas fils' *Dame aux Camélias*, and Meilhac and Halévy's *Frou-Frou*. Sardou's plays *Fédora* (at the Vaudeville), *Théodora*, *La Tosca*, and *Cléopâtre* (with Moreau) were specially written round her emotional and magnetic personality. These with Richepin's

Nana Sahib and Barbier's *Jeanne d'Arc* were her chief successes during her occupancy of the Porte St. Martin theatre (1883-90). During these years and from 1891-93 she toured practically over the whole world, visiting not only the chief towns of Europe and the U.S., but also Australia and S. America. She moved to the Renaissance theatre in 1893 with Jules Lemaitre's *Les Rois*, where she also played in Sardou's *Gismonda*, 1894. In the first of Rostand's poetic dramas, *La Princesse Lointaine*, 1895, she created the part of Mélissande, to be followed by Photine in the same author's religious drama, *La Samaritaine*, 1897. Her appearance in *Magda*, 1895, a French translation of Sudermann's *Heimat*, marked a new departure, to be followed (1899) by her impersonation of Hamlet, a doubtful though daring experiment. She repeated the impersonation of male characters as the hapless Duke of Reichstadt in Rostand's *L'Aiglon* in 1900 at the Théâtre Sarah Bernhardt. Her adaptation of De Musset's *Lorenzaccio* and the revival of Hugo's *Angelo* must be noticed. Her latest new play (1912) is Mouillot's *Queen Elizabeth*, in which she played the title rôle. Gifted with a wonderful voice, which can range over every note of human passion, and with an intensely vivid personality, the 'divine Sarah' represents at its highest the emotional as distinct from the intellectual type of actress. To compare her playing with that of Eleanora Duse in such parts as Magda or the Dame aux Camélias is to realise the creative powers of two actresses of distinct schools of art. It [illegible] freedom given for her [illegible] that has been the [illegible] made to S. B. in the constructed and mechanical plays of Sardou. She married, in 1882, M. Jacques Damala, a Greek, from whom she separated in the following year. Her *Life* has been written by Jules Huret, 1889; *see* also he[illegible] *double Vie*, 19[illegible]

[illegible] (1880-75), Ger. philologist, born at Landsberg, [illegible] was professor at Berlin 1830; *Grundriss der griechischen Literatur*, 1836-45, and an ed. of Suidas, 4 vols. 1834-53.

Berni, Francesco (1497-1535), is the chief of Italian comic poets. His popularity is evidenced by the fact that since his time burlesque poetry is referred to as 'poesie bernesca.' Having held a secretaryship at Rome, he gladly renounced what was to him a drudgery for a canonry in the cathedral of Florence. His fame rests largely on his complete revision (Refacimento) of Boiardo's *Orlando Innamorato*, which was the basis of Ariosto's masterpiece, *Orlando Furioso*. His witty, graceful verse forms a pleasant contrast to the unpolished lines of Boiardo.

Bernicia, an A.-S. kingdom, said to have extended from the Tyne to the Forth; the first king was Ida, 547-559, and his cap. Bamburgh. In 605 Æthelfrith united the southern independent kingdom of Deira with B. as one kingdom, Northumbria. After the death of his conqueror Edwin, 633, it was divided again, but shortly afterwards the Bernician dynasty under Oswio became supreme. The see of the bishopric of B. was at Lindisfarne and later at Hexham.

Bernicle, *see* BARNACLE.

Bernicle or **Barnacle Goose**, the *Anser Bernicla*, is an arctic bird which visits Britain in winter. It receives its name from an anct. fable that it was an offspring of the barnacle (*q.v.*). It is about 2 ft. in length, weighs about 5 lbs., is black and white in colour, marbled with blue and grey, the beak is black, streaked with red. It was bred in Britain by the Earl of Derby in 1834, and its flesh is used for food.

Bernier, François (*d.* 1685), 'a most curious traveller' (as called by Gibbon), *b.* at Angers in Anjou; took the degree of doctor at Montpellier; he set out on his travels in Palestine and Egypt; left Egypt and went to [illegible] and was physician for eight [illegible] to the Mogul Emperor Aurungzebe. He wrote on his return to France a *History of the Empire of the Great Mogul*, which appeared in 1670, and a continuation of this the next year; they were reprinted under the title of *The Travels of François Bernier*, and have been translated into all European languages.

Bernina, the name of a mt., Piz B., 13,304 ft., and of a pass, 7645 ft., in the Rhætian Alps, canton of Grisons, Switzerland. The pass, over which there is a carriage road, leads from Pontresina, Upper Engadine, to Tirano in the valley of the Adda, Italy. The B. Alps form a group lying between the Maloja and the Reschen Scheideck passes. The Piz B. was first climbed in 1850.

Bernini, Giovanni Lorenzo (1598-1680), sculptor, painter, and architect, was invited by Pope Urban VIII. to submit designs for the embellishment of St. Peter's at Rome.

The splendid colossade was the fruits of the invitation. In 1663 he was called to Paris by Louis XIV., and although his design for the Louvre was rejected in favour of Perrault's, he returned to Rome, enriched by gifts as well as honours.

Bernoulli, or Bernouilli, the name of a family of mathematicians and scientists who were famous throughout Europe. Originally residents of Antwerp, they were driven by the persecution of the Spaniards to find refuge first in Frankfort, and afterwards in Basel:

Jacques Bernoulli (1654-1705), born at Basel, was esteemed in his own day as a versifier in Latin, German, and French. He taught himself the elements of geometry against his father's wishes, and from 1676 to 1682 travelled in France, England, and Holland, meeting learned men and extending his own knowledge of mathematics. In 1687 he was appointed to the chair of mathematics at Basel, where he remained until his death. Amongst other investigations, he solved Leibnitz's problem of the isochronous curve, determined the curve formed by a chain hanging between two supports and the curve formed by an elastic rod supported at one extremity and bent by a weight at the other.

Jean Bernoulli (1667-1748) was aided by his brother Jacques in his early mathematical studies, but has achieved a higher reputation as an independent discoverer. He became professor of mathematics at Groningen, and after holding the position for ten years, succeeded his brother in the chair of mathematics at Basel. His works are numerous and important, and amongst his discoveries was that of the exponential calculus. Three of his sons achieved distinction in mathematics.

Nicolas Bernoulli (1695-1726), after a youth of great promise, was appointed professor of mathematics at St. Petersburg, but died after holding the office for about eight months.

Daniel Bernoulli (1700-82), brother of the preceding, studied medicine as well as mathematics, and in 1725 was appointed professor of mathematics at St. Petersburg. In 1733, disturbed by the state of his health, he returned to Basel and occupied the chair of anatomy and botany. His work is concerned with many branches of mathematics, including the investigation of the problems of hydrodynamics and consideration of the theory of probability with respect to some of the practical issues of life.

Jean Bernoulli (1710-90), the third son of Jean B., was born at Basel, studied in France, and became professor of eloquence in Basel. He succeeded his father in the chair of mathematics in 1748. On three occasions he received the prize of the Academy of Sciences at Paris, his subjects being the capstan, the propagation of light, and the magnet. His two sons, the grandsons of the first Jean B., were also accomplished mathematicians.

Jean Bernoulli (1744-1807), became astronomer royal at Berlin at the age of nineteen, and subsequently held the office of director of mathematical studies at the academy of Berlin.

Jacques Bernoulli (1759-89), brother of the preceding, studied law, but could not be restrained from his natural enthusiasm for geometry. After acting as a substitute for his uncle Daniel at the university of Basel for some time, he became professor of mathematics at St. Petersburg in 1788.

Bernoullian Numbers are numbers used in determining the sum of certain mathematical series. For example, the sum of the same powers of the natural numbers from 1 to n may be expressed by the following formula, r denoting the power:—

$$S_n = \frac{n^{r+1}}{r+1} + \frac{1}{2}n^r + B_1\frac{r}{\lfloor 2}n^{r-1} - B_2\frac{r(r-1)(r-2)}{\lfloor 4}n^{r-3} + B_3\frac{r(r-1)(r-2)(r-3)(r-4)}{\lfloor 6}n^{r-5} + \ldots$$

the signs of the series being alternately + and −, starting at the third term. The quantities symbolised by B_1, B_2, B_3, etc., are known as B. N., the first six of which are $\frac{1}{6}$, $\frac{1}{30}$, $\frac{1}{42}$, $\frac{1}{30}$, $\frac{5}{66}$, and $\frac{691}{2730}$. Thus the sum of the series, $1^5+2^5+3^5+\ldots+n^5$ becomes

$$\frac{n^6}{6}+\frac{n^5}{2}+B_1\frac{5}{\lfloor 2}n^4 - B_2\frac{5.4.3}{\lfloor 4}n^2 + \text{zero} = \frac{n^6}{6}+\frac{n^5}{2}+\frac{5n^4}{12}-\frac{n^2}{12}.$$

The values of the first 250 B. N. to nine figures in each case have been published by Glaisher in the *Cambridge Philosophical Society Transactions*, xii. p. 384.

Bernstein, Eduard (*b.* 1850), Ger. Democratic leader and political writer, born in Berlin, and was engaged for some time in journalism, editing the *Sozialdemokrat* during 1881-90. He lived in London from 1888 to 1901 on account of his political views, and on returning to Germany became editor of the *Dokumente des Sozialismus*, and *Welt am Montag*, and was elected to the Imperial Reichstag. His works, mainly critical of the doctrines of

Karl Marx, include *Gesellschaftliches und Privateigentum*, 1891; an ed. of the works of Lasalle, 1891-3; *Die Kommunistischen und Demokratisch-Sozialistischen Bewegungen in England während des 17 Jahrhunderts*, 1895; *Die Voraussetzungen des Sozialismus und die Aufgaben der Sozialdemokratie*, 1899; *Zur Geschichte und Theorie des Sozialismus*, 1900.

Bernstorff, Johann Hartwig Ernst, Count von (1712-72), a Danish statesman, was educated by his grandfather, an able minister of George I. Although he knew many European languages, he could never speak Danish. Having been for six years ambassador at Paris, for twenty-one years following he controlled the foreign policy of his adopted country. The settlement of the disputes between Russia and Denmark on the question of Holstein-Gottorp, was not the least of his achievements. By the treaty of 1765, Catherine II. renounced all pretensions to Holstein. He always preferred to gain his ends by what were often very [illegible] methods of diplomacy ra[illegible] by war. During the Seven Y[illegible] he succeeded in preserving the neutrality of Denmark. Dismissed from office by Struensee's intrigues, he rejected the overtures of Catherine II. His motto was 'Integritas et rectum me custodiunt,' and he justified it.

Bernstorff, Albrecht, Count von (1809-73), a German diplomatist and statesman, born at Dreilutzow, Mecklenburg-Schwerin. He was sent as envoy to Naples, 1840; appointed ambassador at Vienna, 1848; Naples, 1852; London, 1854-61, 1862-73. In 1861-2 he acted as Minister of Foreign Affairs.

Bernstorff, Andreas Peter, Count (1735-97), a Danish statesman, born in Hanover, the nephew of Johann Bernstorff. As minister of foreign affairs in 1773, he took an active share [illegible] armed neu[illegible]ussia, and [illegible]olicy. His [illegible] Britain as to the ter[illegible] caused the [illegible] he was oblig[illegible] However, he was returned to power in 1784, and during the French Wars maintained a decisively neutral policy, and refused to break Denmark's commercial relations with France in 1793. He abandoned his former policy, directed against Sweden, and in 1794 entered into a treaty with that nation. He was a keen supporter of Liberalism and of the freedom of the press, and brought about the emancipation of the serfs.

Bernstorff, Christian - Günther, Comte de (1769-1835), a Danish diplomatist, the son of Andreas Peter B., born at Copenhagen, died in Berlin. He became minister of foreign affairs, 1793-1810, and Danish plenipotentiary at the Congress of Vienna, 1814. He entered the Prussian service in 1818, and was minister of foreign affairs from 1818 to 1831.

Beroe, a small marine organism belonging to the *cœlenterate* order of Ctenophora, subclass Nuda. It differs from the other genera of Ctenophora in having no tentacles of any kind, and in having a capacious stomodœum resembling the cavity of a thimble. It is conical or oval in shape, and there is a cœlenteric network all over the body, formed by anastomoses of the meridians and paragastric canals. It is transparent and gelatinous, and shines at night with phosphoric radiance, produced by the eight bands of fused cilia, by means of which it moves.

Berœa: 1. Ancient name of modern Veria, or Kara-Feria, a tn. of Mace[illegible] [illegible]ean Turkey, 35 m. S.W. [illegible] It was besieged by [illegible] B.C., occupied by Rome [illegible], nd captured by Turkey in 1375 A.D. Paul preached there in 54 A.D. 2. Anct. name of Aleppo, cap. of a vilayet of the same name in N. Syria, Asiatic Turkey, on R. Kocik, 70 m. E. of the Mediterranean. The name of Bœrœa was given it by Seleucus Nicator, and it is mentioned as Helbon (= Aleppo) in Ezek. xxxii. 18.

Bérosus, a Babylonian priest, *fl. c.* 260 B.C. Josephus has preserved some fragments of his Babylonian-Chaldean history, which he wrote in Greek. They are trustworthy, we believe, because he had access to native documents, stored in the temple of Bel, and invaluable, as they refer to an obscure period in Asiatic annals.

Berosus is a genus of coleopterous insects of the family Hydrophilidæ. The species inhabit ponds, in which they swim in an inverted position, and they probably feed on vegetable substance. They are nearly oval in shape, and of a dusky yellow hue.

Berre, the name of a small tn. and of a lake or lagoon, Etang de Berre, in dept. Bouches-du-Rhône, France. The salt-water lagoon, covering nearly 60 sq. m., lies near the sea, with which it is joined by the Canal de Bone. N.W. is the Crau, an expanse covered with pebbles like a beach.

Berretini, *see* CORTONA, P. DA.

Berri, or Berry, was in former times a prov. of France, bounded by Orléannais on the N., Nivernais and Bourbonnais on the E., La Marche on the S., and Touraine and Poitou on the W. It now forms the depts. of Cher and Indre, and part of those of Creuse, Nièvre, and Allier.

Berri, or Berry, Charles Ferdinand Duc de (1778-1820), born at Versailles, 1778, a younger son of the Comte d'Artois, afterwards Charles X. of France. At the revolution he escaped with his father to Italy, fought under Condé (1792-97), and came to England in 1801, where he married a Miss Anna Brown; this was annulled in 1814, and in 1816 he married Caroline Ferdinande Louise, daughter of Francis I. of Naples, *b.* 1798, by whom he had a daughter, later Duchess of Parma, *b.* 1819, and a son, Henri, Duc de Bordeaux, better known as the Comte de Chambord, *b.* posthumously, 1820, after his father had been assassinated by L. P. Louvel at the opera-house, Feb. 13 of that year. After the revolution of 1830 the duchess landed in France in the hope of gaining the throne for her son; she was imprisoned, but on her secret marriage with Count Lucchesi-Palli being discovered, her political power vanished and she was released. She *d.* in Switzerland, 1870.

Berrima, a township in Camden co., New South Wales, 40 m. N.E. of Goulburn. In a coal, shale, iron, and copper mining dist. Pop. 10,000.

Berruguete, Alonzo (1480-1561), a Spanish painter, sculptor, and architect, the son of a painter, Pedro B. (*q.v.*) born at Paredes de Nava, near Valladolid. About 1503 or 1504 he went to Italy to study, where he made the friendship of Michael Angelo, Vasari, and Leonardo da Vinci. On his return to Spain, Charles V. appointed him court painter and sculptor, and superintendent of certain public building enterprises. B. completed the royal palace at Granada, and designed the town hall at Seville and the palace of the archbishop of Toledo at Alcala. His finest piece of sculpture is 'The Transfiguration' in the Toledo Cathedral. There are paintings of his at Salamanca and Valladolid.

Berruguete, Pedro (*d.* 1503), a Spanish painter who lived towards the end of the 15th century. Very little is known of his life, but from his work it appears that he was influenced by the It. school, and it is probable that he lived for a time in Florence. Most of his paintings are in the museum at Madrid. The frescoes in the cathedral at Toledo are thought to be the joint work of B. and another artist. Other works attributed to him are the 'Miracles of the Life of St. Peter,' 'St. Thomas Aquinas,' and 'St. Dominic' (at Avila), and 'Christ in the Garden' and 'The Resurrection' (at Madrid). He was the father and teacher of Alonzo B.

Berry is the name of a baccate or fleshy fruit, which differs from the drupe (*e.g.* cherry) in having no hard part but the seeds; while the drupe has a strong endocarp. All these fruits are soft and succulent, and have their seeds embedded in the pulp. Many so-called *berries* have no right to the name, *e.g.* the holly-berry, which is a drupe; the strawberry, a pseudocarp formed from an etærio of achenes on a fleshy thalamus; while raspberries and blackberries are etærios of drupes. True berries are the gooseberry, tomato, currant, blæberry, and grape, while the orange, melon, and cucumber come under this head, and the banana, in which over-cultivation has destroyed the seeds.

Berry, a tn. of Camden co., New South Wales, on Berry R., 70 m. S.W. of Sydney. Pop. 2000.

Berry, Sir Edward (1768-1831), a British naval officer. He went to sea in 1779, and became a lieutenant four years later. In 1796 he first came under the notice of Captain Nelson, and for his services at the siege of Porto Ferrajo, B. received high praise and promotion to the rank of commander. As a volunteer on board the *Captain*, he distinguished himself for his daring at the battle of Cape St. Vincent. B. was captain of Nelson's flag-ship at the battle of the Nile, of which he later wrote a narrative. B. carried Nelson's despatches home on the *Leander*, when he was taken prisoner by the Fr., and on his arrival in London was knighted, 1798. B. took part in the action of Trafalgar, 1805, and of St. Domingo, 1806. He was created a K.C.B. in 1815, and promoted to the rank of rear-admiral in 1821.

Berry, Sir Graham (1822-1904), Australian politician, born at Twickenham, and emigrated to Victoria in 1852. He entered the Legislative Assembly of Victoria in 1861, but lost his seat in 1865. He became member for Geelong West in 1868, and in 1870 became Treasurer in J. A. Macpherson's ministry, holding the same position under Sir C. G. Duffy during 1871-2. He became Prime Minister and Chief Secretary in 1875, and after a stormy term of office was defeated on a Reform Bill in 1880. He was again Prime Minister from Aug. 1880 to July 1881, and was one of the coalition leaders in 1883. He lived in London as Agent-General for Victoria during 1886-91.

Berry, James (*fl.* 1655), a Shropshire clerk who enlisted under Cromwell and became one of his favourite officers. He fought at the battle of Gainsborough, 1643, where he slew Charles Cavendish. In 1647 B. was elected president of the council of adjutors in the disputes between parliament and the army. In 1655 he

was sent to Nottinghamshire to suppress a rising there, and was subsequently made major-general of Hereford, Shropshire, and Wales. He sat in parliament as member for Worcestershire in 1657, and was made a member of the council of state in 1659. B. took part in the overthrow of Richard Cromwell, which he afterwards regretted. On the Restoration, he was imprisoned in Scarborough Castle, and, refusing to acknowledge any guilt, was confined there to the end of his life. According to Richard Baxter, however, B. was released and 'became a gardener, and lived in a safer state than in all his greatness.' The chief authority on B.'s life is Baxter, whose autobiography, *Reliquiæ Baxterianæ*, should be consulted for further information.

Berry, Sir John (1635-90), an eminent British admiral, born in Devonshire. He first went to sea in the merchant service, his first naval appointment being in 1663, when he served as boatswain of the *Swallow* in the W. Indies. He soon received promotion, and in 1667 commanded a squadron
of Fr. and
St. Kitts.
himself at the battle of Sole Bay, and was knighted for his services. He was in command of the *Gloucester* when it was bearing James, Duke of York, to Scotland, and was shipwrecked outside the Humber. He became vice-admiral of the squadron in 1683 under Lord Dartmouth. His death, at Portsmouth, has been attributed to poisoning. Consult Campbell, *Lives of the Admirals*.

Berry, Mary (1763-1852), an Eng. authoress, born at Kirkbridge, Yorkshire. In 1788 she and her younger sister, Anne, made the acquaintance of Horace Walpole, who held them in great affection, and left them in his will £4000 each and some property at Little Strawberry Hill. Mary B. collected and ed. the *Works of Horace Walpole*, 1798, and also pub. *England and France: a Comparative View of the Social Condition of both Countries*, 1844; and a *Life of Rachael Wriothesley*, 1819. *See* her *Journals and Correspondence*, 2nd ed., 1866.

Berryer, Antoine Pierre (1790-1868), French barrister and politician, was the son of a distinguished advocate and supporter of the Bourbons. After the restoration he defended Ney before the chamber of peers, and was successful in his defence of other of Napoleon's generals. He had a large practice and was active on behalf
press offences.
trials in which
defence were
1826, Chateaubriand, 1833, and Montalembert, 1858. Elected before the revolution in 1830, he remained the *only legitimist deputy till 1851*; a strong Liberal, he never ceased to further the restoration of the Bourbons. He was elected to the Academy in 1854. He died at Angerville.

Bersaglieri, *i.e.* 'sharpshooter,' a *corps d'élite* of infantry (riflemen) in the It. army. They were originally formed in 1836 in the Sardinian army. There are now twelve regiments, one to each army corps, of three battalions and one cyclist battalion each; their uniform is a dark blue with a red stripe and facings, but their chief distinguishing mark is the wide black slouch hat with heavy drooping plumes of cocks' feathers. They are trained to march at a sort of trot, alternating with the ordinary 'quick' or 'double' march, and can cover long distances at a remarkable speed.

Berseem, or **Bersim** (*Trifolium Alexandrinum*), the Egyptian name of a species of white clover which thrives well on salt land newly reclaimed from the sea. In the Nile Delta it is grown as fodder for horses, cattle, and other animals, and its cultivation prepares the land for subsequent crops.

Berserker (from the 'sark,' or shirt, of the bear, or the skins of other animals), is the name given, in Scandinavian mythology, to the twelve sons of the hero, Berserk, by the daughter of King Swafurlam, whom he had killed in battle. Berserk was the grandson of the fair Alfhilde and the eight-handed Starkadder. His sons inherited his martial fury, which was called 'berserker' rage, as well as his splendid courage. They so terrified their enemies that they were regarded as being possessed of an evil spirit. According to one legend they perished together in one combat. The name 'Berserker' was also applied to a race, or rather an association of warriors, who created so much confusion and distress by their continual warfare, that they were finally proscribed by Christianity. 'Berserker' is synonymous in Norse with 'dauntless valour.'

Bert, Paul (1833-86), Fr. physiologist and politician, was born at Auxerre; first studied engineering, but then under the influence of L. P. Gratiolet became a pupil of the great physiologist Claude Bernard. He was professor of physiology at Bordeaux and the Sorbonne, Paris. His prin. scientific researches and experiments were on the effects of air-pressure (*La Pression barométrique*, 1878), of the highest value for the disease known as 'Caisson disease;' on anæsthetics and respiration, and on

the effect of light on plant growth. In 1876 he became a deputy and threw himself into politics as a violent anti-clerical; he was minister of education, 1882, in Gambetta's ministry; in 1886 he was appointed resident to Indo-China, and died there at the end of the same year.

Bertani, Agostino (1812-86), an It. revolutionist, born at Milan. He practised medicine in Lombardy, till the outbreak of the revolution of 1848, in which he was implicated. He organised the ambulance service during the Roman republic, 1849, and, with Sir James Hudson, worked in Naples for the liberation of political prisoners. In 1859 he founded, and for a short time worked on, a revolutionary journal at Genoa, but before long joined Garibaldi's force as a surgeon. From his headquarters at Genoa, he organised four Sicilian volunteer expeditions, and when Garibaldi went to Naples, became his secretary-general. In this capacity he superintended the police, abolished the secret service, and founded infant asylums. He entered parliament in 1861, and after the fall of Rome became leader of the extreme left till his death. During his parliamentary career he made inquiries into the sanitary conditions existing among the peasants. Consult his Life, by Mario, 1888.

Bertha, the name of sev. reigning princesses of the early middle ages: 1. The daughter of the Frankish Christian king, Haribert or Charibert, married Ethelbert (560-616), King of Kent. She brought to England her confessor, Bishop Lindhard; she was allowed by the king to practise her religion at her oratory, St. Martin's, Canterbury, and thus paved the way for [illegible] ission. 2. [illegible] called Be [illegible] She was the daughter of Charibert, Count of Laon, and married Pepin before 742. Round her have grown many legends set forth in Adene's 13th century romance *Berte aus grans piés*. Charlemagne married Bertha (or Desiderata), daughter of the Lombard king Desiderius. Other Bs. of history are: 3. The daughter of Otto, Count of Savoy, wife of the Emperor Henry IV. 4. The daughter of Conrad of Burgundy, married Endes, Count of Blois, and then Robert II., King of France (970-1031). 5. The daughter of Burkhardt of Thurgau, and wife of Rudolf II., King of Burgundy (912-937). Her deeds of charity and piety gained her the name of 'the Good.'

Berthelot, Marcellin Pierre Eugène (1827-1907), distinguished chemist and politician of France. He was born at Paris in October, and was the son of a doctor. He commenced a study of science after winning recognition of his talents in history and philosophy. He was appointed a member of the staff of the Collège de France in 1851, at which time his long intimacy with Renan began. His paper *Sur les combinaisons de la glycérine avec les acids* made him famous in 1854, and in 1865 he accepted a chair of organic chemistry in the Collège de France, an appointment which had been specially created for him. Two years earlier he had become a member of the Academy of Medicine. He succeeded Pasteur as permanent secretary to the Academy of Sciences in 1889. Somewhat previously he had secured an appointment as inspector-general of education, where its relation towards conscription received his particular attention. In 1895 he was minister of public instruction during the Goblet ministry. In 1901 his completion of fifty years' service in the field of science was publicly celebrated in Paris. His wife's death occurred only a very short time before his own sudden end in 1907. His works include many papers and books, among them, *Chimie organique fondée sur la synthèse*, 1860; and *Les carbures d'hydrogène*, 1901; *Science et philosophie*, 1886; and *Science et morale*, 1897.

Berthier, Alexandre (1753-1815), one of Napoleon's generals, proclaimed the republic in Rome in 1798. As chief of the staff he accompanied the emperor to Egypt, and also in the campaigns of 1812-14. On Louis XVIII.'s accession he surrendered Neuchâtel, and submitted to the king. When Napoleon returned from Elba he committed suicide.

Berthierite, a dark steel-grey mineral, composed of sulphides of iron and antimony. It occurs in elongated prisms, has a hardness of 2 to 3 and a sp. gr. of 4 to 4·3. B. is found in Auvergne and the Vosges, in Saxony, in Cornwall, and in Lower California. It receives its name from the French chemist, Pierre Berthier (1782-1861).

Berthold von Regensburg (1220-72), mediæval Ger. Franciscan preacher, born at Regensburg and educated in the Franciscan monastery there under David of Augsburg. After 1250 he took up the life of an itinerant teacher in Alsace, Switzerland, Austria, Hungary, Poland, Italy, S. Germany, Bohemia, and Moravia. His last years were spent at Ratisbon, where he died. His sermons, based on French models and full of realistic imagery, were always heard with enthusiasm. His teaching was mainly directed against luxury, the abuses of so-called

'chivalry,' and the vices of the clergy. His 'Sermons' have been edited by Pfeiffer and Strebl (2 vols. 1862-80), and by Göbel (trans. into modern Ger. 1873). *See* his *Life* by J. Paul, 1896, and Unkel, 1882.

Berthollet, Claude Louis (1748-1822), a Fr. chemist, born at Talloire in Savoy. He graduated in medicine at Turin, settled in Paris in 1772, and, having rapidly built up a reputation by his chemical researches, was elected a member of the Academy of Sciences in 1780. Five years later he frankly declared himself a convert to the new theories of combustion propounded by Lavoisier, although previously he had pub. papers in support of the old. He helped Lavoisier to reform chemical nomenclature, and was the first to advocate the use of chlorine as a bleaching agent. As he regarded chlorine as oxygenated muriatic acid, he could not appreciate the nature of the chlorates which he discovered. Besides investigating the composition of ammonia, sulphuretted hydrogen, and prussic acid, he devoted serious attention to the process of smelting and converting iron into steel. Napoleon proved for him a generous patron.

Bertholletia is a remarkable genus of Lecythideæ growing in tropical S. America, and having only two species. The tree grows to a height of about 100 ft., and branches gracefully near the top. The fruit is a spherical case as large as a man's head, with four cells, in each of which are six or eight triangular seeds with hard and wrinkled shells. This fruit is of great weight, and is indehiscent. The seed is the Brazil nut of commerce, which is nutritious as a food and yields an oil well suited for lamps.

Berthon, Edward Lyon (*1813-99*), an inventor, born in Finsbury Square, London. He studied surgery at Liverpool and Dublin, and lived for some years (*1834-40*) abroad, where he experimented on screws for propelling ships. His model of a screw propeller was, however, rejected by the Admiralty, though [illegible] adopted. In 1841 he wer[illegible] bridge, and took holy orde[illegible] and subsequently held [illegible] Fareham and Romsey. His other mechanical inventions were 'Berthon's log' for measuring the speed of ships, an instrument for discovering the trim of a boat, and collapsible boats, which were first ordered by the Admiralty in 1873. He wrote his reminiscences under the title *Retrospect of Eight Decades*, 1899.

Bertie, Peregrine, Lord Willoughby de Eresby (1555-1601), a British soldier, son of Richard and Catherine B., Baroness of Willoughby, de Eresby. He was born at Lower Wesel, Cleves, at the time of the Marian prosecution in England. His family returned to England in 1559, when a patent of naturalisation was obtained for him. He married a daughter of John de Vere, Earl of Oxford, and in 1580 succeeded to his mother's title. In 1582 he was sent to Denmark to discuss the commercial relations of England with that country, especially the position of Eng. merchant ships on Danish seas. In 1585 he petitioned Frederick II. on behalf of Henry of Navarre; and was made governor of Bergen-op-Zoom, 1586, in succession to Sir Philip Sidney. He was present at the attack on Axel, 1586, at the attempted relief of Sluys, and succeeded the Earl of Leicester as commander of the Eng. forces in the Low Countries, 1587. Subsequently he was placed at the head of an army which went to the assistance of Henry of Navarre at Dieppe, 1589, and was present at the capture of Vendôme, Mons, Alençon, and Falaise. He was appointed governor of Berwick and warden of East March, 1598-1601. Consult Lady Georgina B., *Fire Generations of a Loyal House*, 1845.

Bertie, Richard (1517-82), the husband of the Duchess Dowager of Suffolk, in her own right Baroness Willoughby de Eresby, and father of Peregrine B. (*q.v.*). He was born in Hampshire, and became a scholar of Corpus Christi College, Oxford. He was attached to the household of Thomas Wriothesley, the Lord Chancellor; as his wife was not a Catholic, he felt the danger of living in England under the rule of Queen Mary, and in 1555 escaped with her to France, and after running great dangers, they finally were kindly received by the king of Poland, and remained in that country till the death of Mary. He sat in parliament in 1562-3 as a knight of the co. of Lincoln. There is a monument to his memory and to that of his wife in Spilsby Church, Lincolnshire.

Bertie, Robert, first Earl of Lind- [illegible] 'he eldest son of [illegible], and godson of He joined the [illegible] of the Earls of Essex and Nottingham, and was knighted in the market-place of Cadiz, on its capture, 1597. He succeeded to his father's title in 1601, and from his mother, the daughter of John de Vere, Earl of Oxford, he inherited the office of Lord High Chamberlain, 1626. He was made a Knight of the Bath in 1605, and created Earl of Lindsey in 1626. In 1628, after the assassination of Buckingham, he was appointed Admiral of the Fleet, and headed an expedi-

tion (which failed) for the relief of La Rochelle. He loyally supported Charles I. during the Civil War, and died from wounds received at the battle of Edgehill in 1642.

Bertie, Willoughby, fourth Earl of Abingdon (1740-99), an Eng. statesman. He was educated at Westminster School and at Magdalen College, Oxford. He early made the acquaintance of Wilkes, whose democratic principles he supported. B. succeeded to the earldom in 1760, and frequently spoke in the House of Lords, taking care, by means of 'handsome fee,' to procure the insertion of his speeches in the newspapers. He pub. numerous tracts and pamphlets, which include *Thoughts on Burke's Letter on Affairs of America*, 1777, and *A Letter to Lady Loughborough*, 1798, which is a eulogy of the French Revolution, and passed through eight editions.

Bertillon System. Anthropometry, the name given to this system by its inventor. M. Alphonse Bertillon, consists of a careful measurement of certain parts of the human body which he found by diligent research to be practically unchanging after full growth. By these it is possible so to classify any individual as to be able to identify him without fail for the rest of his life. For police purposes this was invaluable, and Bertillon's system was adopted in most civilised countries. The essential measurements are these: (1) Length of head, (2) breadth of ditto, (3) length of middle finger, (4) of left foot, (5) of forearm from elbow to tip of middle finger. Each of these measurements was classified as small, medium, or large, and height, length of little finger, and colour of eyes were also observed. Each person's complete record was entered on a card, and these cards were compared and sorted so ingeniously that any particular one required could be found with great quickness. The measurements, however, had to be so extremely accurate, and required such carefully trained observers, that the process of 'Bertillonising' was slow and expensive. As the slightest mistake in one respect might vitiate a whole record, it was necessary to take the mean of at least three measurements. In 1897 the system was superseded in India by Galton's simpler and cheaper 'finger-print records,' which were adopted in England three years later.

Bertin, Louis François (1766-1841), the 'father of Fr. journalism,' born in Paris in December 1766. He wrote for the *Journal Français* during the French Revolution. He founded the *Journal des Débats* after the 18th Brumaire. In 1801 he was banished for suspected royalist tendencies. Three years later he returned again, taking up the management of the paper. Meanwhile Napoleon had altered the title to *Journal de l'Empire*. Government censorship and control followed. He regained possession in 1814, still supporting the royalist cause till his death in 1841. He was of a family possessing many famous members, all of whom were concerned with the *Journal des Débats*.

Bertin, Louis Marie Armand (1801-54), Fr. journalist, was the son of the more famous Louis François B. After the Restoration he came to England as Chateaubriand's secretary. In 1820 he obtained a position on the *Journal des Débats*, and, on his father's death in 1841, became editor.

Bertinovo, or Bertinoro, episcopal tn. of Forlì, Italy, 7 m. S.E. of Forlì. It has mineral springs. Pop. 7800.

Bertran de Born, Viscount of Hautefort in Périgord (*b. c.* 1140), Provençal troubadour, born of noble family, near Limoges. He became a vassal of England by the marriage of Eleanor to Henry II. of England, and was patronised by Henry Curtmantle, son of Henry II. Dante has placed him (*Inferno*, canto xxviii.) among the 'sowers of discourd' in hell, where he appears carrying his severed head before him; this referring to the way in which he fostered and took advantage of the ill-feeling existing between the three sons of the king. During 1182-3 he joined with the barons of Limoges, Poitou, and Périgord in their revolt against Richard I. of England. He was besieged at Hautefort, and ultimately became reconciled to Richard. About 1196 he entered a Cistercian monastery at Dalon, where he died early in the 13th century. His poems, of which forty-five are still extant, deal with 'arms and men,' and are either in praise of his patrons or depreciation of his enemies. The style is rough but effective, and the love-poems and two 'planhs' on the death of Prince Henry, are tender and sincere. They have been ed. by Stimming, 1879 and 1892, and Thomas, 1888.

Bertrand, Henri Gratien, Count (1773-1844), Fr. general. He entered the army as a volunteer at the outbreak of the French Revolution. He was made a colonel by Napoleon during the Egyptian expedition, and was afterwards his aide-de-camp at Austerlitz. Napoleon further honoured him by appointing him grand marshal of the court in 1813. When the Fr. army crossed the Danube at Wagram, it was under B.'s direction that the building of the bridges was organised. In 1814 he accompanied Napoleon

to Elba, and returned after Waterloo to St. Helena with him. After Napoleon's death he was elected deputy in 1830 by Louis XVIII., and later brought the remains of Napoleon to France. He died at Chateauroux, and owes a great popularity to his *fidelity to his master.*

Bertrand, Joseph Louis François (1822-1900), Fr. mathematician, *b.* in Paris and educated at the Polytechnic School. In 1842 he took up a position in the Service of Mines, and later held professorial posts at the Polytechnic School, the Normal School, and the Collège de France. In 1856 he became a member of the Academy of Sciences, in 1874 perpetual secretary of that body, and in 1884 a member of the Fr. Academy. He was appointed an officer of the Legion of Honour in 1867, and commander in 1881. He pub. works on arithmetic, algebra, calculus, thermodynamics, and *probalities, and contributed largely to* scientific journals.

Beruni, or Al-Beruni (*d.* 440), Arabian historian, who *fl.* at Ghazni during the reign of the Emperor Mahmud. His works, dealing with Indian history, include *India* (trans. 1888), and *Chronology of Ancient Nations* (trans. 1879).

Bervic, Charles Clement (1756-1822), Fr. engraver. He was born at Paris, and acquired a lasting fame by his execution of a full-length engraving of Louis XVI. from the portrait by Callet. It ranks among the finest works of its kind extant. He died on March 23.

Bervie, a market tn. and seaport in Kincardineshire, Scotland, on the N. British Railway; pop. under 2500.

Berwick, James Fitz-James, Duke of (1670-1734), was the illegitimate offspring of the Duke of York, afterwards *James II.*, by Arabella Churchill, the sister of the famous general, Marlborough. Educated in France, on his father's accession he entered the imperial army, serving his apprenticeship as a soldier in Hungary under the *celebrated Duke of Lorraine.* Later he accompanied his father into exile, took part in the disastrous battle of the Boyne, and in 1690 was made generalissimo of the Irish forces on the side of James. Having witnessed the ruin of his father's cause at the naval battle of La Hogue, he transferred his services to France. In 1693 he was taken prisoner at the battle of Linden, but was soon exchanged for the Duke of Ormond. His attempt in 1696 to stir up a popular insurrection against William III. was fortunately a failure. After suppressing the religious wars in the S. of France, he distinguished himself, during the Spanish War of Succession, by defeating the allied forces under General *Stanhope* in the battle of Almanza, which secured Philip V. on the throne of Spain. The title of Duke of Liria and Xerica was conferred on him in recognition of his courage and good services. Though *accused of cruelty* and an ungracious, haughty demeanour, he ranks among the most celebrated captains of his age.

Berwickshire, a Scottish county, bounded on the N. by Haddingtonshire and the N. Sea; on the E. by the N. Sea; on the S.E. by Berwick; on the S. by the Tweed and Roxburghshire, and on the W. by Midlothian. Its area is 457 sq. m., and its coastline 21 m. There are three natural divs. of the co.: (*a*) Lauderdale, the valley of the Leader; (*b*) Lammermuir, the mountainous dist. of the hills of that name; and (*c*) the Merse (march or borderland), the widest area. The average height of the Lammermuirs *is 1000 ft., and their highest peak is* 1749 ft. (Mt. Says Law). The coast of B. is precipitous, and only accessible at Eyemouth Harbour, Coldingham, and Burnmouth. St. Abb's Head rises to 310 ft. and possesses a lighthouse. Of the rivers, the Eye is the only significant one that flows directly to the sea. The others, Leader, Eden, Leet, and Whiteadder, are tribs. of the Tweed. The largest of these is the Whiteadder. Small lochs are at Coldingham, Legerwood, and Spottiswoode.

The climate of B. is most suitable for the cultivation of vegetables, and it is not severe in winter owing to its maritime situation. The prin. grain crops are oats and barley, though wheat is raised in parts. Sheep and *cattle are pastured in large numbers.* Fishing is second in the industries. [illegible] ed are in the Burn- . The chief fish caught are cod, haddock, herring, ling, lobsters, and crabs. As far as mineral wealth is concerned, coal, copper-ore, and ironstone exist but in quantities too small to work, while the large deposits of limestone lie too far from the coal area to be of any value. Gingham and woollen cloth stuffs are manufactured at Earlston, while blankets and plaids are produced at Cumledge. Other industries are distilling and brewing. Communication is maintained by the *N. British Railway. The pop. of the* co. in 1901 was 30,824.

The history of the co. reveals traces of Rom. and anct. *British settlement.* The co. became included in the kingdom of Northumbria after the Rom. occupation. In 1018 the co. was annexed to Scotland, but was taken by England finally in 1482. The co.

contains many picturesque ruins, among them being Fast Castle, Cockburnspath Tower, Dryburgh Abbey, and Hume Castle. Bibliography: *Minstrelsy of the Mersc*, W. S. Crockett, 1889; *A Short Border History*, F. H. Groome, 1887.

Berwick-upon-Tweed, a seaport, municipal bor., and self-contained co. of England. It is situated at the mouth of the Tweed on its N. bank. Its pop. in 1901 was 13,437. As a market tn. it has some standing. It forms a junction of the North Eastern and North British railways. Among its ruins are those of a bell tower which was used to alarm the neighbourhood during border raids. Of its public buildings the chief is the town hall (1760). The town is connected to the S. side of the river by two bridges. The prin. exports are grain, coal, and fish. Among its sea fisheries are those of the herring and salmon. The tn. has iron works and shipbuilding yards. In border history the tn. has figured with some prominence. In 1296 it experienced a memorable siege by Edward I. In the 12th century it was one of the first seaports of the country. It was finally ceded to England in 1482, though it had been annexed in 1333 at the battle of Halidon Hill.

Beryl, a mineral consisting of silicates of beryllium and aluminium, represented by the formula $Be_3Al_2Si_6O_{18}$. It crystallises in hexagonal prisms, usually of a greenish colour. The transparent green varieties are known as emerald, and those possessing a bluish-green colour are termed aquamarine. Transparent B. is known as precious B., and was formerly esteemed as a gem, but the opaque varieties are known as common B. B. is widely distributed, being found in Aberdeenshire, the Mourne Mts. in Ireland, Siberia, Brazil, Ceylon, and many localities in the United States.

Beryllium, or **Glucinum**, a metal of the magnesium group, discovered in the form of oxide in the mineral beryl in 1798. The oxide was first called glucina from the sweet taste of its salts, but was afterwards called beryllia by the Ger. chemists. The metal was first obtained by Wöhler in 1828 by reducing the chloride with potassium, when the metal appears as a dark grey powder. In 1855 Debray prepared it in a compact state by heating B. chloride and metallic sodium in separate receptacles in an atmosphere of hydrogen. The metal thus produced has a sp. gr. of 1·64, is silver white in colour, melts at a lower temperature than silver, and in the powdered state takes fire when heated in air. Beryllium oxide, or Beryllia, is obtained by fusing beryl with twice its weight of potassium carbonate. The molten mass is allowed to cool, and is then treated with sulphuric acid, the excess of acid evaporated off, water added, and the silica filtered out. On cooling, the liquor contains mainly the sulphates of B. and iron. It is poured into a hot and strong solution of ammonium carbonate, allowed to stand for some days, and then filtered. The filtrate contains the B., and on boiling B. carbonate is precipitated. The precipitate is redissolved in ammonium carbonate solution and steam blown through the liquid, when the beryllia is precipitated.

Beryx, a genus of acanthopterygious fossil fish of the family Berycidæ. It was a deep-sea fish, perch-like in form, and some species, *e.g. B. ornatus*, are found fossilised in the chalk of Sussex.

Berzeline, or **Berzelianite**, a silver-white mineral composed of copper selenide (Cu_2Se), occurring at Skrikerum in Sweden and also in the Harz Mts. B., as named by L. A. Necker, is a white translucent mineral found near Albano, and composed of silicates of aluminium, sodium, and calcium.

Berzelite, or **Berzeliite**, a yellow or yellowish-red mineral occurring as isometric crystals and consisting of orthoarsenate of calcium, magnesium, or manganese. It is found at Långban in Sweden. Pyrrharsenite, in which antimony takes the place of part of the arsenic, is lighter in colour and occurs at Orebro in Sweden.

Berzelius, Jöns Jakob (1779-1848), Swedish chemist, born at Väfversunda Sorgard, Sweden. He studied chemistry and medicine at Upsala University, and in 1802 took his M.D. From 1815 to 1832 he fulfilled the professorship of chemistry in the Caroline Medico-Chirurgical Institute at Stockholm. In 1818 he became perpetual secretary to the Stockholm Academy of Science. His special study was now devoted to the significance of atomic and molecular weight, and he pub. a table of results remarkable for their correctness. He held that the essence of chemistry was based upon oxygen. Later he developed an acute interest in electrochemistry. He was the first to adopt the symbol system of alluding to chemical substances. His works include *Lehrbuch der Chemie* and *Jahresbericht*, both works notable for their literary quality besides their scholarship. Of the latter work, which was a yearly record of Stockholm Academy science progress, he issued 27 vols. He invented many improvements of the blow-pipe and threw much light upon the sub-

stances tellurium, selenicum, silicon, thorium, titanium.

Bes, an Egyptian deity, prominent after the twentieth dynasty, whose functions included art, song, dancing, and childbirth. He is probably of foreign origin; was also worshipped in Cyprus and Phœnicia, and has been identified with Typhon. He is repre-

dept. of Doubs, of which it is the cap. Its pop. in 1906 was 41,760. Hills surround its position on the l. b. of the Doubs, at the foot of the W. Jura Mts. A feature of the tn. is its shady promenades. It is the seat of an archbishop. The chief industry is watchmaking, which came first into the city from Neuchâtel about the latter part of the 18th century. Most of the watches sold in France are manufactured here. Lesser industries embrace enamelling, saw-mills, printing works, distilleries, and the manuf. of paper, boots, machinery, hosiery, leather, elastic, and artificial silk. A tunnel under the city allows the passage of the Rhine and Rhone Canal. The tn. is strongly fortified. The city is of great antiquity. In the time of Julius Cæsar it was known as Vesontio, while Marcus Aurelius made it a 'colonia.' Till 1789 it was the seat of a 'parlement.' During its history, specially during the earlier centuries following Marcus Aurelius, it suffered demolition and reconstruction alternately.

Besant, *see* BEZANT.

Besant, Annie, Mrs. (*née* Wood), (*b.* 1847), an English theosophist. She was born in London, and in 1867 married the Rev. Frank B., Vicar of Sibsey, Lincolnshire. In early life she was a ritualistic High Churchwoman, but became a free-thinker, and was legally separated from her husband in 1873. In the following year she joined the National Secular Society; she co-edited with Charles Bradlaugh, M.P., *The National Reformer*, and took a prominent part in his Free Thought and Radical movement. She joined in various labour movements, became a member of the Fabian Society, and of the London School Board, 1887-90. In 1889 she became a pupil of Mme. Blavatsky, and joined the Theosophical Society, of which she has been president since 1907. She has lectured on theosophy in all parts of the world, and has founded at Benares the Central Hindu College, 1898 and the Central Hindu Girls' School, 1904. She has pub. her life, under the title *Through Storm to Peace*, 1893, and is a voluminous writer. Her works include: *Reincarnation*, 1892; *Death and After*, 1893; *The Building of the Kosmos*, 1894; *Four Great Religions*, 1897; *Avatâras*, 1900; *A Study on Consciousness*, 1904; *Theosophy and the New Psychology*, 1904; *The Wisdom of the Upanishats*, 1906.

Besant, Sir Walter (1836-1901), Eng. author. He was born at Portsmouth on Aug. 14, 1836. His father was William B., a Portsmouth citizen. During his education he passed successively through King's College, London, and Christ's College, Cambridge. In 1859 he graduated as eighteenth wrangler, while during the years 1861-67 he was senior professor at the Royal College, Mauritius. The Palestine Exploration Fund made him secretary in 1868. He occupied this position till 1885. An interest in young and inexperienced authors and their invariably inadequate remuneration caused him to found a Society of Authors. This body was formed with the object of protecting literary aspirants from unscrupulous and grasping publishers. It was, in fact, a trade union of authors. This was founded in 1884, and Sir Walter filled its chair till 1892. He married in 1895 Mary Foster Barham, of Bridgewater, and shortly afterwards was knighted. On June 9 he died at Hampstead. Though Sir W. B. plunged into many fields of literary art, his greatest success was in writing novels. These enjoyed a great and lasting popularity. He collaborated with James Rice in the production of the first of these works of fiction, and *Ready-Money Mortiboy* and *The Golden Butterfly* are two of the finest. The influence of Dickens is apparent, and a consequent tendency towards caricature is detected. There are many indications, however, of clever humour, and evidences of superior observation. The establishment of the East End Institute, known as the People's Palace, in the Mile End Road, was one of the direct results of his powerful book *All Sorts and Conditions of Men*. This was a vivid picture of East End life which he wrote alone, James Rice having died. The sweating evil next received his attention, and expression of his indignation was found in *The Children of Gideon*. The work of Canon Barnett and others in the interests of reclamation work in the East End of London was given a valuable fillip by B.'s writing, for the movement was made popular by their influence. His other novels are *Dorothy Forster*, 1884; *Amorel of Lyonesse*, 1890; and *Beyond the Dreams of Avarice*, 1895. Besides the branch of fiction, critical and literary studies resulted in *The French Humourists*, 1873; *Rabelais*, 1879; and biographies of Whittington, Captain Cook, and Richard Jefferies.

Among his works on the history and archæology of London the most important is *A Survey of London*, which unfortunately was never completed, while other works on the same subject evince a wide knowledge of London's history and a remarkable grasp of its significance and relation to life's problems. See *Autobiography of Sir Walter Besant*, 1902.

Besika Bay, a bay on the N.W. coast of Asia Minor. It is situated opposite to Tenedos, to the S. of the entrance of the Dardanelles. During the disturbances arising from the Eastern Question, 1853 and 1877, the English fleet was stationed there.

Beskow, Bernhard von, Baron (1796-1868), a Swedish poet and dramatist, born in Stockholm. In 1825 he was appointed to the position of private secretary to the Crown Prince Oscar, and subsequently held certain minor offices at court. He was director of the Royal Theatre in 1831-2. His chief works are the poems, *Karl XII.*, 1819, and *Sveriges Anor*, 1824, and the tragedies *Erik den Fjortonde*, 1827-8, and *Torkel Knutsson*, 1830. *See* Rydqvist, *Bernhard von Beskow.*

Besnard, Paul Albert (*b.* 1849), a Fr. painter, born in Paris; he entered the studio of Cabanel in 1866, and won the Prix de Rome in 1874. In 1882 he received a commission to paint frescoes for the School of Pharmacy. His principal works are: 'St. Benoît et enfant,' 'La Vie renaissante de la mort,' 'Femme qui se Chauffe,' etc., and numerous delicate pastel drawings. In 1879 he married Charlotte Vital Dubray, a sculptor of some note.

Besni, or Beshni, a tn. of Asiatic Turkey, 50 m. N.W. of Urfa; pop. about 15,000.

Bessarabia, a gov. of S.W. Russia. The R. Pruth separates it from Moldavia and Wallachia on the W. and S., the Dniester divides it from Kherson and Podolia on the E. and W., while on the S.E. it is bounded by the Black Sea. Its area is 17,614 sq. m. Spurs of the Carpathians invade the N. at a height of 800 to 1150 ft. The soil is fertile and agriculture is the prevailing occupation, the chief crops being wheat, maize, barley, flax, tobacco, water-melons, fruit, vine, saffron, and madder. The central belt is rich in timber, while lower are the rich pastures of the Budjuk Steppes. Sheep, cattle, and goats are raised here. The climate is extreme, while the rainfall is over 25 in. annually. Manufs. are in their infancy, wine, cloth, iron goods, and soap being the chief articles produced. The pop. is mixed, and in 1906 consisted of 2,262,400 beings. These comprise Moldavians, Little Russians, Jews, Bulgarians, Germans, Gypsies, Greeks, and Armenians. The chief tns. are Akkerman, Bender, Byeltsi, Izmail, Khotin, Kishiner, Orgeyer, and Soroki.

Bessarion, John (1395-1472), was a famous scholar who was instrumental in spreading the knowledge of Greek literature over the W. of Europe. When the Gk. emperor went to Italy to effect the union of the two churches B. accompanied him. Having joined the Roman Church, he became Bishop of Frascati, and later papal legate at Bologna. Pope Eugene IV. had made him cardinal, and he might himself have been pope but for his strong sympathies with Plato and other heathen philosophers. He bequeathed his valuable collection of Gk. MSS. to St. Mark's Library, Venice.

Bessbrook, market tn. of Armagh, Ireland, 2½ m. N.W. of Newry. Main industry, linen weaving and bleaching. Pop. 3000.

Besse-en-Chendesse, a small tn. in the dept. Puy-de-Dôme, France.

Bességes, a tn. of S.E. France in the Gard dept., on the Cèze. In 1906 its pop. was 7662. Coal mines, ironworks, and blast furnaces make the town important.

Bessel, Friedrich Wilhelm (1784-1846), Ger. astronomer, was born at Minden on July 22, 1784. A wish to study navigation, mathematics, and astronomy led him to leave a counting-house for the position of supercargo on a foreign voyage. His investigations on Halley's comet led to recognition by H. W. M. Holbers, who pub. his results. Further distinction met him on a brilliant investigation and report of the 1807 comet and he was installed by the King of Prussia as director of a new observatory at Konigsberg. Here he stayed from 1813 till his death. He tabulated a catalogue of 3222 stars, and pub. it under the title *Fundamenta Astronomiæ*, 1818. Among his secondary achievements was the improved heliometer. His most important astronomical work is *Astronomische Untersuchungen*, 1841.

Bessels, Emil (1847-88), Ger. scientist and arctic explorer, *b.* at Heidelberg, and studied natural science and medicine there and at Jena. His first Polar journey was made in 1869 to the regions lying between Spitzbergen, Novaya Zemlya, and Gillis Land, and enabled him to demonstrate the presence of the Gulf Stream E. of Spitzbergen. In 1871 the U.S.A. gov. appointed him ship's physician and chief of the scientific dept. to the expedition under C. F. Hall in the *Polaris*. The vessel was wrecked and all Bessels' collections lost in 1873. He pub. an account of the expedition

in 1876, and also *Die Americanische Nordpolexpedition*, 1878.

Bessel's Functions, in mathematics, indicate certain relationships between two variables. F. W. Bessel introduced them in 1817 in investigating mathematical relationships in connection with planetary orbits. Later they have been employed in calculations concerned with the vibrations of a stretched membrane, thus contributing to the theory of sound; and in calculations connected with almost every branch of mathematical physics. B. F. of order m is indicated by the symbol $J_m(\rho)$, and satisfies the differential equation:

$$\frac{d^2\mu}{a\rho^2}+\frac{1}{\rho}\frac{d\mu}{a\rho}+\left(1-\frac{m^2}{\rho^2}\right)\mu=0.$$

See Gray and Matthews, *Treatise on Bessel's Functions*.

Bessemer, a tn. of Jefferson co., Alabama, U.S.A., 16 m. S.W. of Birmingham. It has blast furnaces, rolling mills, foundries, machine shops, etc. Pop. 6500.

Bessemer, Sir Henry (1813-98), an English engineer, was born at Charlton, Herts. He was the author of many inventions, though the chief achievement with which his name is immediately connected is a special process of steel manufacture called the B. process. To-day the process has been equalled and eclipsed, but at the time of its introduction no other method of manuf. was so valuable, and it came as a revolution in the civilised world. His attention to steel had been caused by an attempt to improve the quality of artillery pieces. Difficulties in its adoption had to be surmounted, but finally B. profited to the extent of over a million pounds by his discovery. Among his other inventions, considerably less important than that of the new steel process, were gold paint, a movable die for embossed stamps, and a saloon fitted to a ship which was guaranteed to remain level despite the violence of any sea. In practice the last named failed to justify its adoption.

Bessemer Process is a process for freeing wrought iron and low carbon steel from mechanically entangled cinder. It was first introduced in 1865 by Mr. (afterwards Sir) Henry Bessemer. By its cheapness and effectiveness, it soon displaced other methods, and is now generally used in Britain, the United States, and in many places on the Continent. It is largely used in making rails, ship plates, boiler plates, etc., though recently, other processes, such as the Siemens-Martin process, have come into competition with it. When Mr. Bessemer proposed to convert crude pig-iron into malleable iron while in a fluid state, and to retain the metal in such a state long enough for it to be cast into moulds, without employing any fuel in the process, the project was generally regarded as chimerical. It was, however, eminently practicable, as Mr. Bessemer demonstrated by erecting works, with borrowed capital, and underselling all his competitors. The principal of the B. P. is briefly as follows. Molten pig-iron is converted into steel by having a large number of fine streams of air forced through it, causing the oxidation of its impurities, such as carbon, silicon, and often its phosphorus and sulphur. The intense heat thus generated, without the use of any other fuel, is sufficient, not only to melt the iron and keep it in a molten state, but to raise its temperature to above the melting point of steel, that is to 1500° C. The B. converter, in which this process is carried on, is an immense retort, made of boiler plates, and lined with some refractory material, such as dolomite, firebrick, or ganister. It is suspended aloft, and mounted on axes at or near its centre of gravity. It is turned on trunnions, through the right one of which the blast is carried to the gooseneck, which delivers it to the tuyères at the bottom. There are two varieties of converters. The original one is undephosphorising, because it is lined with material, such as silicic acid. The dephosphorising or Thomas Gilchrist process is the name applied when the converter is lined with basic materials. It was patented in 1878, but it is only a modification of the B. P. For further details as to the proportions of carbon, silicon, sulphur, phosphorus, manganese, and copper in the different varieties of B. steel, and the character of the spectrum of the flames, etc., *see* the article on STEEL.

Besse-sur-Braye, a small tn. in the dept. of Sarthe, France.

Bessonov, Peter Alexievitch (1828-98), Russian philologist, *b.* at Moscow; became professor of Slavonic literature at the university of Cracow in 1879. He pub. a large number of works with Bulgarian and literature, collections of the popular songs and folklore of the Servian, Bulgarian, and Russian peoples. The Bulgarian collection appeared as *Bolgarskiya Pêsni* in 1855, and the Servian as *Lazarica* in 1857.

Bessus (*d.* 328 B.C.), Satrap of Bactria under Darius III. In 331 B.C., after the battle of Gaugamela, he captured Darius, and, on being pursued by Alexander, murdered him. He was betrayed to Alexander and put to death by him.

Best, George (*d.* 1584 ?), a British navigator, who accompanied Martin Frobisher in 1576, 1577, and 1578 on his three voyages to discover the N.W. Passage. B. pub. an account of these journeys under the title, *A True Discourse of the late Voyages of Discoverie for the Finding of a Passage to Cathaya by the North-weast, under the conduct of Martin Frobisher, generall*, 1578. The work was exceedingly popular, and was trans. into Fr., Lat., and It. Copies of the *True Discourse* are very rare; it was included in Hakluyt's *Voyages*, vol. iii. (1600), which has been reprinted by the Hakluyt Society in 1867. It is probable that B. was killed in a duel by Oliver St. John, Viscount Grandison, about 1584.

Best (afterwards Beste), Henry Digby(1768-1836),an Eng. writer,born at Lincoln and educated at the grammar school there. He took his B.A. degree at Oxford in 1788. In 1791 he took holy orders, but influenced partly by the writings of Richard Newton and partly by Abbé Beaumont, a Catholic priest in Lincoln, began to entertain doubts as regards the spiritual supremacy of the Church of England, and in 1799 was received into the Roman Catholic Church. In 1818 he left England for a time and lived in France and Italy. He wrote on miscellaneous subjects; his works include: *Four Years in France . . . preceded by some Account of the Conversion of the Author to the Catholic Faith*, 1826; *The Christian Religion briefly defended against the Philosophers and Republicans of France*, 1793; *Italy as it is*, 1828; *Personal and Literary Memorials*, 1829.

Best, Thomas (*c.* 1570–1638), a British naval officer, who went to sea about 1583. In 1612, while in command of the *Red Dragon*, defeated the Portuguese at Surat, and his victory estab. Eng. trading rights in India as equal to those of the Portuguese. From Surat he sailed to Acheen, and obtained permission to open trade with Siam. In 1617 he was sent as chief commander to Bantam, but a charge of favouritism to his son was brought against him by the East India Company, and he was dismissed from the service. In 1623 B. headed an expedition against the Dutch, who had blockaded a privateer at Aberdeen; he commanded the *Vanguard* in the unfortunate expedition to Rhé, 1627; in 1630 and 1632 he acted on commissions to report on various naval matters; and in 1634 was appointed Master of Trinity House.

Best, William Thomas (1826-97), an Eng. organist, born at Carlisle. He was appointed organist of the Liverpool Philharmonic Society in 1849; of the Panopticon, London, 1852; and Lincoln's Inn Chapel, 1854; and of St. George's Hall, Liverpool, 1854. He was himself a composer, and arranged pieces for the organ. His publications are: *The Modern School for the Organ*, 1853, and *The Art of Organ-Playing*, 1870.

Bestiary (Fr.), a class of books which were in popular demand during the middle ages. It described all the animals in the universe, both living and fabulous. Part of the description was versified, and many illustrations illuminated the works. In addition to their zoological value, they imparted many moral lessons in allegorical form. All the varying qualities of good and evil in the heart of man were personified by some creature or other of the beast world. As the age was then one of symbolism this is a natural characteristic. On churches and other buildings of the middle ages there are many weird and fantastically-conceived creatures sculptured. It is believed that these supernatural conceptions were derived from the current Bs. The famous *Physiologus* of the Greeks was the source whence the earliest Latin Bs. were derived. This *Physiologus* contained about fifty allegories. Old Syriac, Armenian, Ethiopic, Arabic, Icelandic, and numerous Latin versions of it were issued. Those of the Latin were Mai, Heider, and Cohier. Earlier than the 11th century a Ger. version was made. Philippe de Thaun and Guillaume, a priest of Normandy, made a Fr. version in the 12th century. Richard de Fournival's *Bestiary d'Amour* is a satire upon the earlier works.

Bestushev, Alexander (1797-1837), Russian author. A captain in the army, he was exiled to Yakutsk for conspiracy in 1825, but entered the army of the Caucasus in 1829. Most of his novels deal with military life in the wild dists. of the Caucasus. They include *Mullah Nur* and *Ammalet Beg*, and sev. of them have been trans. into Ger. His collected works appeared in 1839 under the title of *Marlinski's Tales*.

Beta, second letter of Greek alphabet. *See* ALPHABET, and B.

Beta is the name of a European genus of Chenopodaceæ, many varieties of which are cultivated in Britain for food. *B. vulgaris* is the common beet; *B. vulgaris macrorrhiza*, the mangold-wurzel, used as food for cattle.

Betanzos, a tn. of Spain. It is situated to the S.E. of Corunna about 10 m. Its pop. is 8122. Anciently it was called Brigantium Flavium.

Betelgeux, or α Orionis, a bright star situated in the eastern shoulder of the constellation of Orion. It is a

long period during which from 1·0 to star in Secchi's third type, i.e. it is reddish in colour and of a comparatively low temperature. The spectroscope reveals the presence of sodium, magnesium, and iron in its composition, but no hydrogen. B. has a small parallax, 0″·02, which means that it is very remote, its distance being 160 light-years. Its brilliancy exceeds that of the sun many hundred times, and it is estimated that it is receding from the solar system at the rate of fifteen miles a second.

Betel Nut Palm (*Areca catechu*), a tree indigenous to Malaysia, but cultivated also in Southern India, Ceylon, Siam, and the Philippines. It grows about 50 ft. high, branchless, but bearing a crown of large fronds. The fruit, nearly the size of a hen's egg, contains the nut used by Asiatics for mastication. Gathered and husked before they are fully ripe, the nuts are then boiled, sliced, and sun-dried. Each piece for chewing is wrapped in a leaf of the betel pepper-vine, with some lime and often an aromatic flavouring. The betel reddens the mouth and blackens the teeth, but preserves them.

Beth, *see* BEIT.

Betham-Edwards, Matilda, a poet and novelist, the daughter of Edward Edwards and Barbara, *née* Betham. She became Officier de l'Instruction Publique de France, 1891. Her publications are: *Kitty*, 1872; *France of To-day; The Dream-Charlotte*, 1896; *The Golden Bee* (ballads), 1896; *A Romance of Dijon; Anglo-French Reminiscences*, 1899; *A Suffolk Courtship*, 1900; *Mock Beggar's Hall*, 1901; *East of Paris*, 1902; *Home Life in France*, 1905; *Literary Rambles in France*, 1907; *Poems*, 1907; *French Men, Women, and Books*, 1910.

Bethania, a post vil. of the co. of Forsyth, U.S.A. It is situated 8 m. from Salem.

Bethany, a vil. 2 m. E.S.E. of Jerusalem. It goes under the name of Lazariyeh by the natives of Palestine, for it was the residence of Lazarus and his sisters. It is at the present day an insignificant place, boasting a mere 200 inhab. The only object of interest is the supposed tomb of Lazarus. Of the ecclesiastic buildings erected about the 4th century little or no trace is existing. It is situated on Mt. Olive at a height of 2208 ft. above sea-level. The same name, B., is given to three tns., or rather mission stations of Germany, in S. Africa. They are situated in Great Namaqualand, Orange Free State and Transvaal respectively.

Bethel, a pile of ruins called to-day Beitin, and situated about 11 m. N. of Jerusalem. The name trans. is 'house of God.' Scriptural mention of it makes it the scene of Jacob's dream. Formerly the place was known as Luz. Abraham stayed here, while afterwards the Ark of the Covenant was deposited in its precincts. Still later it became a royal residence and a centre of heathenish adoration. About 2000 people inhabit the present village.

Bethell, Richard, Baron Westbury (1800-73), Lord Chancellor, born at Bradford-on-Avon; educated at Corsham, near Bath, Bristol, and Oxford; called to the bar as a member of the Middle Temple in 1823. His first success was in the case of Attorney-General *v.* Brasenose College. In 1840 he became a Queen's Counsel, and in 1841 was leader of the chancery bar. He made an unsuccessful attempt to enter parliament as M.P. for Shaftesbury in 1847, but was returned for Aylesbury in 1851 and for Wolverhampton in 1852. In 1851 he was appointed Vice-Chancellor of the Duchy of Lancaster, in 1852 Solicitor-General, and in 1856 Attorney-General. He became Chancellor in 1861 on the death of Lord Campbell. He was forced to retire in 1865, owing to certain charges which were brought against him, but remained in public life until his death.

Bethesda: 1. A public bath of Jerusalem. Here Christ's healing of the impotent man occurred. Birkit Israel, situated in Jerusalem, has been identified with it since the year 1102. It is in that part of the city near the gate of St. Stephen and Omar's Temple. Other declarations of its site are those of Condor, who claims it to be identical with a spring called Gihon and En Rogel in the Kedron valley; and Schick who, in 1889, made a discovery of the remains of the pool's construction near St. Anne's church. 2. A small tn. of Carnarvonshire, from whose Nonconformist chapel it derives its name, and situated about 4 m. from Bangor to the S.E. The Penrhyn slate quarries, adjacent to the town, employ most of its 5799 inhabitants.

Beth-horon, Upper and Lower (modern Beit 'Ur et Teahta and Beit 'Ur el Foka), two vils. of Palestine, 10 m. N.W. of Jerusalem, on frontier between Benjamin and Ephraim. Joshua defeated the Amorites in the pass between the two (*see* Joshua x. 1-11), and Judas Maccabeus defeated the Syrians here in 166 B.C.

Bethlehem: 1. The modern Beit Lahm, is situated 5 m. S. of Jerusalem, 2350 ft. above sea-level. It has no natural springs, but wheat,

olives, etc., grow in its neighbourhood, and its wine is excellent. It is famous as the home of David, the scene of Ruth's story, and above all as the bp. of Jesus. Christian pilrimages thither began before A.D. 132. In A.D. 315 Constantine built a basilica, near which is a cave venerated, since Jerome's time, as the stable. 2. A post-bor. in the co. of Northampton, Pennsylvania, U.S.A. It is situated on the R. Lehigh, and is connected by rail with Philadelphia, 55 miles distant. The Moravians founded the tn., whose inhab. are still mostly of that nationality. Silk, paint, and flour are its chief products, while it enjoys a certain notoriety for its schools. It is joined to S. B. by two bridges across the Lehigh, and to W. B. by Monocacy Creek. Of the three boroughs the pop. is 15,000. 3. Tn. of Grafton co., New Hampshire, U.S.A., on Ammonoosuc R., 75 m. N.W. of Concord. A favourite summer resort of the White Mt. dist., having an elevation of 1460 ft. Pop. (resident) 1300. 4. Tn. of Orange Free State, S. Africa, 125 m. N.E. of Bloemfontein, in an argic. region, with an excellent climate. White pop. 1500.

Bethlehem Hospital, *see* BEDLAM.

Bethlehemites, the name of various societies following: 1. An order of monks of England who lived in the 13th century, and who founded a monastery at Cambridge, 1257. 2. A military order founded by Pope Pius II. to prevent an attack from the Turks in 1459. 3. A society of Guatemala founded in 1659 and patronised by Pope Innocent XI. in 1687. Bethlehem Church in Prague gave the name also to its followers who were led by John Huss.

Bethlen-Gabor, a member of an anct. Hungarian Protestant family. He was born in 1580 and distinguished himself during unrest in Transylvania. He was later the chosen prince on the death of Gabriel Bathori in 1613. In 1619 he led the Bohemians against the Austrians in defending their rights. His victories led to his proclamation as King of Hungary in 1621. Varying fortunes, which finally resulted favourably to him, ended in a peace with Ferdinand II. of Austria. Gabor relinquished the title of King of Hungary, though he gained large acquisition of ter. and the title of Prince of the Empire. The breaking by Ferdinand of the treaty saw Gabor's invasion with 60,000 men and consequent renewal of the violated conditions. In 1629 he died. Besides the high standard of military skill attained, he aided and endowed science and art.

Bethmann-Hollweg, Dr. Theobald Theodore von (*b.* 1856), a German statesman, born in Hohenfinon, in the prov. of Brandenburg. He was educated at the universities of Strassburg, Leipzig, and Berlin, and entered the Civil Service. He became president of the dist. of Bromberg, and later of the prov. of Brandenburg, 1899; Prussian Minister of the Interior, 1905; Imperial Secretary of State for the Interior, 1907; Chancellor of the Ger. Empire, and Minister of State for Foreign Affairs, 1909.

Bethnal Green, suburb in the E. of London, and a parl. bor. since 1885. A large portion of its pop. consisted formerly of silk-weavers from the Huguenot settlement, Spitalfields. In 1872 Queen Victoria opened a branch of the S. Kensington Museum here. Now the principal occupations are matchbox-making, boot-making, and cabinet-making. Pop. (1901) 129,680.

Bethphage, associated with Bethany in the N.T., was a vil. near the Mt. of Olives, on the road from Jerusalem to Jericho.

Bethsaida, a vil. on the W. shore of Lake Galilee. It was the bp. of Peter, Andrew, and Philip. Nothing now remains save a pile of grass-covered ruins. Another B. is situated at the E. extremity of the lake. It was named Julius by Philip the Tetrarch, after a daughter of Emperor Augustus.

Beth-shemesh: 1. Anct. city of Palestine, probably the modern Ain Shems, a vil. 15 m. S.W. of *Jerusalem*. Frequently mentioned in the O.T. as a city of N. Judah, between Kirjath-jearim and Timnah, originally a Levite city and later the chief city of Dan. Jehoash, King of Israel, captured Amaziah, King of Judah, here. *See* Josh. xxi. 16, and 2 Kings xiv. 11. 2. City of Naphtali, Upper Galilee. *See* Josh. xix. 38. 3. City of Issachar. *See* Josh. xix. 22. 4. Temple of On, Lower Egypt. *See* Jer. xliii. 13.

Bethulie, a tn. of Orange Free State, S. Africa, near Orange R., 39 m. S.W. of Bloemfontein. There are coal mines near. Pop. 1700.

Bethune, a Fr. tn. in the dept. of Pas-de-Calais. It is situated on a rock facing the R. Brette. It owes its importance to the manuf. of soap and beet sugar, and a trade in bleaching. Till 1713 the tn. was of Flemish occupation. From here the Scottish family of B. is said to have come to England accompanying William of Normandy. Its pop. was 12,601 in 1906.

Bethune, Edward Cecil (*b.* 1855), a British soldier. He entered a Highland regiment in 1875, became a major in 1895, a colonel in 1901, and attained the rank of major-general in

1908. He has served in the Afghan War, 1878-80, and in the Boer Wars of 1881 and 1899-1902; for the last-named war in S. Africa he raised and commanded 'Bethune's Horse.' He was created C.B. in 1905, and C.V.O. in 1909.

Bethylus, in entomology, is a genus of small *hymenopterous* insects of the family Proctotrypidæ. The species are four-winged flies remarkable for their large depressed heads, and somewhat resemble ants in appearance. They are found chiefly in dry and sandy situations.

Bethylus, in ornithology, is a genus estab. by Cuvier and placed among the Laniidæ, butcher-birds or shrikes. The species described by him is a native of Guiana and Brazil, and is parti-coloured, black and white, like the common magpie.

Betony, *Stachys betonica*, is a common British plant belonging to the Labiatæ order. It is found in damp shady places, in hedgerows, woods, etc. The leaves are long, with toothed edges, and the blossoms, which appear in July and August, are of a purple colour. It was in ancient times regarded as a herb of great medicinal value. It can be used to extract a kind of yellow dye.

Betrothment (A.-S. *treowth*, truth) is giving one's troth, used invariably now as pledging oneself to marry. It was anciently a much more formal ceremony than it is to-day, having most of the binding force of a marriage. Roman law (*sponsalia*) imposed the duty on betrothed persons to become husband and wife in a reasonable time, except where death intervened. The custom was practically abolished in the Christian church by the Council of Trent, because it so frequently led to clandestine marriages; but subsequently Bs. became common again on the Continent. Since a betrothal is a legal contract, it is valid only between parties whose capacity is recognised by law, as for instance, the persons must be of age. Betrothals induce a strict obligation to marry, and should either party eventually refuse, the other may obtain damages in an action of breach of promise. Betrothal as a term of art in English law has fallen into disuse, it being rather the mere promise to marry than any formal betrothal that gives rise to the legal obligation. On the Continent betrothals are of greater significance, and in Germany are publicly announced.

Betsileo, a negro tribe inhabiting [illegible] of Central [illegible] houses of [illegible] are built on hill-tops and surrounded by sev. concentric fosses. They were subjugated by the Hovas early in the 19th century. They are good agriculturists, and number about 300,000. Their main town is [illegible].

Bettelheim, [illegible] trian author, bc [illegible] there and at Munich; worked at journalism during 1881-6, and then took to biography and literary criticism. His work includes *Beaumarchais*, an excellent biography, 1886; *Lives of Anzengruber*, 1891, and *Marie von Ebner-Eschenbach*, 1900, the former being included in the biographical series; *Führende Geister*, which he began to edit in 1890; and collected essays under the titles *Die Zukunft unsers Volkstheaters*, 1892; *Deutsche u. Franzosen*, 1895, and *Acta Diurna*, 1899. He has also ed. *Deutsche Geisteshelden*, 1895, and *Biographisches Jahrbuch*, begun in 1896.

Betterment, a term used to describe the additional value a tenant has caused his landlord's land to possess. It is often the case that, through the exertions of a tenant, the owner of the land reaps the benefit from labour expended by persons not responsible to him. Hence it resembles 'unearned increment,' and politicians, both professional and amateur, are devoting their attention to the levy of a tax that shall compensate the actual worker before the owner of the land. Naturally a great amount of controversy is raised by the various proposals put forward. The solution of the whole problem lies upon a more intelligent adjustment of land values.

Betterton, Thomas (1635-1710), an Eng. tragedian, was the son of an under-cook in Charles I.'s household. After the Restoration he served the Duke of York's company, and acted so well that the king sent him to Paris to study stage scenery. Cibber eulogises in very flattering terms his representation of Othello, Hamlet, and other Shakespearian characters. It was thought that he was indebted to his imitation of the great actors he had seen as a youth for the excellence of his acting. Having fallen on evil days, he was given a benefit, when he took the part of Valentine in Congreve's *Love for Love*.

Bettia, a tn. in British India in Bengal. It consists of ten different dists., the soil of which is used for the cultivation of indigo.

Bettinelli, Saverio (1718-1808), a distinguished It. writer, after being educated at a Jesuit college, became a member of that society. He was in succession professor of literature in Brescia, and of rhetoric in Venice, rector of the royal college of Parma, and lecturer on eloquence at

Modena. On the suppression of his order in 1773, he wandered from city to city. His chief work is the *Risorgimento d'Italie*, wherein he traces the progress of science and art in his country, whilst his tragedy of *Xerxes* added considerably to his renown.

Betting, the act of staking money on the result of some future event, usually of a sporting nature, but not necessarily so. The word is supposed to be derived from the Old Fr. *abeter*, to instigate. The origin of the custom is not exactly known, but it dates back to the very earliest days, especially in Eastern countries. By far the largest part of B. in England takes place over horse-racing, and the men who make a profession of taking bets are known as bookmakers. Up to the early part of the 19th century none of these existed, as such, but the first man to take bets in a really scientific and business-like manner was William Ogden in 1793, who can be called the first proper bookmaker. B. is illegal except at properly authorised race meetings, and then it must be in Tattersall's Ring. The B. is of two kinds: post B., when the wagering begins when the numbers of the horses are hoisted on to the board just before the race, and ante-post B., when the wagering takes place weeks before the event. Bets on all big races, such as the Derby, the Oaks, the St. Leger, the Cambridgeshire, or the Cesarewitch, often takes place nearly a year previous to the race meeting. Bets are quoted in most newspapers, and as the public take them up so the prices are regulated. Many papers, however, are against this publication on moral grounds, and to keep undesirables from public libraries a good many of these institutions make a point of blacking out all the B. news before the papers are put on view. The theory of B. is simple, but in practice it is more complicated. The bookmaker will make a book for a certain amount, say fifty, a hundred, or a thousand pounds, and his endeavour is to lay an equal amount of his book against every horse in the race. The odds, of course, change with the current quotations of each horse. For those who would wish to know in more detail of the exact methods of B. (for we must in an article of this length but deal broadly with the subject) can find what they want in Tattersall's *Rules on Betting* and Rowntree's *Betting and Gambling*. Bookmakers who wish to carry on their business otherwise than at race meetings, call themselves 'commission agents,' and profess only to take money on behalf of others. Some have offices abroad, notably at Flushing in Holland, where, of course, the Eng. B. laws have no power. The Betting Acts of 1853 and 1874 were made to prevent bookmakers having too much power, while the Gaming Act and the Anti-Gambling League are also instrumental in keeping the evils attendant on this custom somewhat in check. The Betting Acts above mentioned enforce that 'no house, office, room, or other place' shall be resorted to for the purpose of B. The word 'place' has been held to mean even an umbrella or stool belonging to a bookmaker at a race meeting who is outside Tattersall's Ring. B. debts cannot be recovered in a court of law, and this is a very sharp thorn in the side of the bookmaker, for a debtor, should he like to be unfair enough, has but to plead the Gaming Act to free himself from all responsibilities of such debts. Welshing is the term given to the practice which some smaller bookmakers adopt of disappearing with the stake-money before a race, or should they see that the result is likely to be against them. The laws on street B. are very severe, especially upon those making books with persons under the age of sixteen. For the first offence any one taking bets in a public place is fined £10; for the second offence, £20; and for the third offence, £50 or six months, and so on, according to the number of convictions. Among some of the famous bets that have taken place during the last hundred years may be mentioned that of Lord George Bentinck, who won £20,000 when Crucifix won the Oaks in 1840, and three years later the same nobleman stood to win £150,000 if his horse Gaper had won the Derby; the horse lost, but Lord George won £30,000 on another horse. John Gully and Ridsdale won £100,000 over the Derby and the St. Leger in 1832, and Sir Joseph Hawley won £80,000 when Beadsman won the former race in 1858. Lord Glasgow once laid £90,000 to £30,000 with Lord George Bentinck. Capt. Machell gained over £60,000 when Hermit won the Derby, while over the same race the notorious plunger, the Marquis of Hastings, lost the enormous sum of £103,000. Such reckless B., however, is not carried on nowadays. In France B. is carried on in quite a different fashion to the method in vogue in England. The system in use in the former country being an apparatus known as the 'pari-mutuel.' It is a large frame with a pigeon-hole for each horse, into which the stakes are placed, the bettor obtains a voucher for his money, and the numbers are exhibited after the race. The Fr. municipal authorities often get large amounts from this source, they deduct a certain percentage from the

stake-money, and another percentage is also set aside for the poor before the money is divided up amongst the winners. This system was introduced into France in 1865, and a few years later into England, where, however, it did not find favour, and was soon abolished and declared illegal as being a gaming machine. The system is still sometimes used in the colonies, where it is known as the 'totalizator.' In Japan, however, it was declared illegal in 1908.

Wagers are a form of B. not usually associated with the race-course, but are a hazard on any event, sporting or otherwise, sometimes on things of an absurd nature. Lotteries, still another method of B., take the form of taking tickets for small or large amounts on the chance of winning big sums of money. The earliest lottery properly established was one in Florence in 1530, and in 1571 a special official was appointed in Venice to supervise these affairs. From Italy the lottery passed into France and gradually spread over Europe. The first one known in England was at the end of the 17th century. Lotteries are now illegal in England, however, although they still flourish on the Continent, where they are sometimes run by the states, in fact Austria, Denmark, and Prussia have raised loans by this means. In America, as in England, they are now forbidden by law. The gaming-table is also a popular form of B.; this is now also illegal in England, though in 1620 they were licensed in London and were very popular all through the 18th century, fortunes being staked and lost frequently, but in the early part of last century the games of faro, basset, hazard, or roulette, were prohibited, and the custom has gradually died out, although many secret gambling dens still exist in the West End of London. Monte Carlo is, of course, the great place for gaming tables, and at a good many of the health resorts on the Continent the practice is still very much in vogue, but only quite small sums are allowed to be staked at one time, generally not exceeding 5 frs. Ostend has a large kursaal with many tables, and although officially abolished in France in 1838, gaming tables for the small amounts alluded to above are still to be found at places like Dieppe and Boulogne. Before the formation of these places the small state of Monaco (Monte Carlo) is the only European resort for legal gambling.

Bettws-y-coed, an urban district of Carnarvonshire, situated 4 m. from Llanrwst and 16 from Llandudno. Its pop. in 1901 was 1070. Its name signifies 'house of prayer (from Old English bede-house) of the wood.' The sev. Bettws in Wales make the y-coed necessary for purposes of distinction. Artists and tourists are attracted to the spot. Fishing for trout and salmon yields large results. Among its waterfalls the best known are Llugwy, Lledr, and Conwy.

Betty, William Henry West (1791-1874), a famous English actor. He was popularly known as the 'Young Roscius.' He was born at Shrewsbury, Sept. 1791, and first appeared on the stage at the age of twelve as Osman in *Zara* by Aaron Hill, which was Voltaire's *Zaire* in Eng. Spontaneous success led to a journey to Dublin. While here he is said to have re-memorised the part of Hamlet in three hours. Favourable comparison with past great masters of tragedy followed his achievements. The House of Commons was adjourned by Pitt one night to allow members to attend a performance where he was appearing. His last appearance was made in 1808, for public enthusiasm died away. After an education at Christ's College, Cambridge, he retired to the enjoyment of a large fortune he had acquired by his extraordinarily precocious abilities.

Betul, or Baitul: 1. Dist. of Central Provs., British India. Mountainous, with large forests and some coal mines. Cap. Badnur. Area 3826 sq. m.; pop. 285,000. 2. Tn. of above dist., 112 m. N.W. of Nagpur. Pop. about 5000.

Betula is the generic name of the birch, and gives its name to the natural order Betulaceæ. There are about thirty-five species of this tree, growing in northern lands, the best-known European variety being *B. alba*, the common birch, found at the northern tree-limit. *B. pendula* is the weeping birch; *B. papyracea* of N. America is the paper or canoe birch used in making canoes. *See* BIRCH.

Betulaceæ, an order of dicotyledonous trees or shrubs found largely in N. lands. It comprises six genera, of which typical plants are the birch, alder, hornbeam, and hazel-nut. The male and female flowers grow in catkins on the same plant, and may have perianth-leaves. The stamens vary in number from two to ten, there are two united carpels, while the fruit is a one-seeded nut.

Betuwe, a dist. of Holland, situ-

and Homburg in the Hesse-Homburg landgravate, were at one time two of the most famous resorts in Europe of gamblers. Since the suppression of

ated between the Waal R. and the Rhine R., in the prov. of Gelderland. It is very fertile.

Betwa, a riv. in India, rising in Bhopal in Malun. It joins the Jumna after a course of 360 m. A canal 168 m. long is fed by it for irrigation purposes in the Jalaun dist.

Betzdorf, a tn. of Rhine Provs., Prussia, 45 m. S.E. of Cologne. Has iron and machine works. Pop. 4800.

Beulé, Charles Ernst (1826-74), a Fr. archæologist and politician, born at Saumur. He became professor of archæology at Athens, where he discovered the propylæa of the Acropolis. On his return to Paris, he was appointed to the professorship of archæology at the Bibliothèque Nationale, 1854; in 1858-9 he made excavations on the site of Carthage. In 1871 he was elected, as an Orleanist, to the National Assembly, and was Minister of the Interior under MacMahon, 1873. His publications were numerous and include: *L'Acropole d'Athènes*, 2 vols. 1854; *Etudes sur le Péloponnèse*, 1855; *Les Monnaies d'Athènes*, 1858; *Phidias, Drame Antique*, 1863; and *Histoire de l'Art grec avant Périclès*, 1868. Consult Ideville, *Monsieur Beulé, Souvenirs Personnels*, 1874.

Beust, Friedrich Ferdinand von (1809-86), Austrian count and statesman. He was descended from a distinguished and noble family who had been connected with the Mark of Brandenberg. He was born at Dresden. Educated at Leipzig and Göttingen, he entered the public service of Saxony. In 1836 he became secretary to the legation at Berlin. His later appointments led him to London, Paris, and Munich. An outbreak of revolution in 1848 prevented his projected appointment as war minister. In the following year, however, he was appointed minister for foreign affairs. An outbreak of revolution caused by the king's refusal to accept the Frankfort constitution, was quelled, and B. had to restore order. His vigorous methods at suppression earned him bitter animosity and consequently, to a certain degree, unjustifiable slander. He speedily became one of Germany's most prominent figures. Conflict with Bismarck followed later, and though the war of 1860 was directly caused by Bismarck, B. was blamed for it. A friendship, however, with Bismarck was formed later, but shortly after, and with no hitherto explained reason, B. was dismissed from office. He died in retirement in 1886, having proved himself the possessor of rare qualities as a statesman, spoiled perhaps by that rarely conquered weakness vanity.

Beuthen: 1. A tn. of Germany in the N. of Prussian Silesia, situated on the Oder. Its pop. (1900) was 3164. The prin. industries are straw-plaiting, boat-building, and pottery. It is known also as Niederbeuthen. 2. A tn. of Germany in the S.E. of Prussian Silesia. Its pop. in 1900 was 60,078. It is a mining centre for iron and zinc.

Beuvry, a tn. of Pas-de-Calais dept., France, 3 m. S.E. of Bethune; pop. (commune) 4800.

Beuzec-Conq, tn. of Finistère dept., France, 12 m. S.E. of Quimper; pop. (commune) 5000.

Beuzville, a tn. of France, situated in the dept. of Eure, and 7 m. S.E. from Honfleur. Pop. 2000. Also a French vil. situated in the dept. of Seine, Inférieure arron., 16 m. N.E. by E. from Havre. Pop. 2000.

Bevagna, tn. of Umbria, Italy, 18 m. S.E. of Perugia. Has a trade in wine. Pop. (town) 2000, (commune) 6000.

Beveland, North and South, two is. in the Scheldt estuary, Holland. They are of the Zeeland Is., of which group S. B. is the largest and most fertile. It has a pop. of 23,000. N. B. is a low marshy tract.

Beveren, a tn. of Belgium, situated in E. Flanders. A large proportion of its inhab. are employed in the manuf. of point lace. It contains a famous church. Its pop. is 8637.

Beveridge, William (1637-1708), Bishop of St. Asaph, studied the classical and semitic languages as sizar of St. John's College, Cambridge. In 1661, having obtained his M.A. degree, he was ordained deacon and priest. Before finally accepting his bishopric he refused those of Wells and Bath. Piety and devotion distinguished him through all his preferments. In 1824 nine vols. of his sermons and other writings were pub., but none save the curious read any book of his except *Private Thoughts upon Religion*, published in 1709.

Beverivijk, a commune and prov. of N. Holland, 7 m. by rail from Haerlem; pop. 5500.

Beverland, Adrian, a Dutch scholar who aroused great comment among [illegible] his unorthodox [illegible]n at Middelburg, He studied law, visited Oxford University, and settled in Holland as an attorney. His pamphlet, *Peccatum Originale*, was produced in 1678, and was burned publicly, while its author suffered both imprisonment and expulsion from Utrecht and Leyden. He subsequently returned to the Hague, and wrote *De Stolatæ Virginitatis Jure* in 1680. This work caused a greater storm of obloquy than even his previous writing. Lack of support drove him

to England, where he found an enthusiast in Isaac Vossius. Later he became mentally deranged, and his death took place not long afterwards in 1712.

Beverley, a tn. in the E. Riding of Yorkshire. It is connected with the R. Hull by a canal. It is 8 m. N.N.W. of Hull city. Corn and coal are its chief articles of trade, while tanning and the manuf. of agricultural tools are the chief industries. The town possesses a *magnificent Gothic* minster of the Collegiate Church of St. John. For architectural beauty it *compares with York Minster itself.* There is also a grammar school whose foundation is of such antiquity that its exact date is unknown. The name is a *development* of Beverlac, meaning 'lake of the beavers.' In 1901 its pop. was 13,183.

Beverley, John de (*d.* 721), an Eng. ecclesiastic, born at Harpham in Yorkshire, was for thirty-three years Archbishop of York, and was tutor to the Venerable Bede. He founded a college at Beverley for secular priests. After his death he was honoured as a saint, and William the Conqueror ordered that the town of Beverley should be spared when he ravaged *the whole of Yorkshire. Among B.'s* works are *Pro Lucâ* [illegible] addressed to Bede, a Gospel of St. Luke, and [illegible]

Beverley, John of (14th century), the Carmelite monk; he was doctor [illegible] *trum Or-*

dinariæ.

Beverloo, a small tn. of Belgium, situated in the prov. of Limbourg, and 12 m. N.W. from Hasselt.

Beverly, a tn. of Massachusetts, U.S.A. It is situated on an inlet of the Atlantic opposite Salem. By rail it is 18 m. N.E. of Boston. Its importance is due to the *virtues of its* harbour, its fisheries, and a large manuf. of shoes. Its pop. in 1906 was 15,491.

Bevis of Hampton is the principal character of an English mediæval romance which was very popular. His father was Sir Guy, Earl of Hamtoun. On the murder of his father by the Emperor Divoun of Almayne, his false mother sold him to heathen merchants as a slave. Thus he journeyed to Ermony where he won the affection of the King Ermyn and the love of his beautiful daughter, *Josiau. The conquest of* Brandemond of Damascus, the slaying of a ferocious boar, and of a fearsome dragon, and the overthrow of a giant named Ascapart, whose life he spared, are among his numerous achievements. He possessed a celebrated sword called Morglay. His final coup was the slaughter of some 60,000 citizens of London and the forcing of King Edgar to grant terms. His death after *thirty years of domestic felicity* took place at the same time as that of his wife and his horse, *Arundel.* Dr. Kölbing edited the romance for the Early English Text Society in 1885.

Bewcastle, *a vil. of Cumberland*, 10 m. N.E. of Brampton. In the churchyard is an anct. stone headless cross, *14 ft. high, bearing* a runic inscription probably dating from the 7th century. Pop. 800.

Bewdley, bor. of Worcestershire, on Severn, 14 m. N.N.W. of Worcester. It has manufs. of leather, combs, brass and iron ware, malt, bricks, and *rope. The tn. is an ancient one*, and its prosperity dates from the 15th century. Pop. (1901) 2866.

Bewick, Thomas (1753-1828), a famous Eng. wood-engraver, was the son of the lessee of a small colliery. Showing small aptitude for learning, but decided talent for art, he was apprenticed, in 1767, to Ralph Beilby, a Newcastle engraver, with whom he afterwards entered into partnership. Having pub. many woodcuts in his *Select Fables*, he estab. his reputation *as a dexterous, accurate engraver* by [illegible] and tail-pieces of his [illegible] which appeared in 1790. [illegible] *ight genius, and virile* humour, however, are most conspicuous in his *History of British Birds*, the value of which is further enhanced by his practical knowledge of their habits. This book is universally regarded as his masterpiece.

Bex, a vil. of [illegible] Vaud, on the Rhone, 26 m. [illegible] has salt mines in the vicinity. The tn. is also noted for its sulphur-baths, which make it a common resort for invalids. Pop. (1900) 4600.

Bexhill, a holiday resort, 5½ m. W. by S. of Hastings, on the coast of Sussex, England. It is on the L.B. and S.C. Railway. Pop. over 12,000.

Bexley, a tn. on the Cray, in Kent, England, 5 m. S.E. of Woolwich; pop. 13,000.

Bey, *see* BEG.

Beyerlein, Franz Adam (*b.* 1871), Ger. novelist and dramatist, born at Meissen; educated at Freiburg and Leipzig. In 1903 he wrote the play *Zapfenstreich* and the novel *Jena oder Sedan*, both dealing with military life, which created considerable sensation. His other plays include *Dämon Othello*, a tragedy, 1895, and *Das Siegesfest*, 1896; and among his other novels are *Das graue Leben*, 1902; *Similde Hegewell*, 1904, and *Der Grossknecht*, 1905; *Zapfenstreich* has been translated into Eng. as *Taps.*

Beyle, Marie Henri (1783-1842), better known by his pen-name of Stendhal, was born at Grenoble, and was in turn soldier, shopman, and diplomatist. After some years spent in the commissariat, he accompanied Napoleon on the Russian campaign, and earned some reputation in the disastrous retreat from Moscow. After the fall of Napoleon, he refused to continue in his position, and took up his residence in Milan. In 1821 he was compelled to leave this city, and returned to Paris, where he soon became known in literary circles. In 1830 he was appointed consul at Trieste and then at Civita Vecchia, and in this post he continued till his death at Paris in 1842. His works are numerous, chiefly falling into the divisions of critical works and novels. Of the first div. are: *Histoire de la peinture en Italie*, 1817; *Rome, Naples, et Florence*, 1817; *Racine et Shakespeare*, 1823, 1825; *Promenades dans Rome*, 1829. His chief novels are: *Armance*, 1827; *le Rouge et le Noir*, 1831; *la Chartreuse de Parme*, 1839. Amongst a variety of miscellaneous works the following are interesting: *Essai sur l'Amour*, 1822; *Mémoires d'un touriste*, 1838; *Correspondance*, 1855; *Journal de Stendhal*, 1888; *Vie de Henri Brûlard*, 1890; *Souvenirs d'égotisme*, 1892; and *Lettres à sa sœur*, 1892, all pub. posthumously, are interesting on account of their autobiographical nature. Stendhal's chief characteristic is his supreme egotism, which considerably restricts his expression. He had, however, the gift of psychological analysis, and it is for this, rather than for continuity and arrangement of plot, that his novels are valuable. He was one of the 'idéologues' of the 18th century, and has been hailed as a precursor of Romanticism and Realism. His originality is carried to such an extent that it becomes artificial, and he often seeks after it to an exorbitant degree. *See* A. Paton's *Henri Beyle*, 1874; and E. Rod's *Stendhal*, 1892.

Beypur, seaport of India, Malabar dist. of Madras, near mouth of Beypur R. It is on the railway from Madras across India. Some iron and coal are found in the vicinity. Pop. 6730.

Beyra, *see* BEIRA.

Beyrich, Heinrich Ernst (1815-96), German geologist and palæontologist, born at Berlin. In 1856 he became professor of geology and palæontology at Berlin University, and in 1873 director of the geological dept. He was associate director of the Prussian Geological Survey and superintended the production of the geological chart of Prussia and Thuringia. His pub. works include *Beiträge zur Kenntnis der Versteinerungen des rheinischen Uebergangs-gebirges*, 1837; *Untersuchungen über Trilobiten*, 2 vols., 1846; *Konchylien des Norddeutschen Tertiärgebirges*, 1853-7; *Ueber einige Cephalopoden aus dem Muschelkalk der Alpen*, 1867.

Beyrout, *see* BEIRUT.

Beyschlag, Willibald (1823-1900), Ger.. born studying divinity at Bonn and Berlin, he was appointed professor of theology at Halle in 1860, which post he occupied till his death. His numerous works include: *Die Christologie des Neuen Testaments*, 1866; *Leben Jesu*, 2 vols. 1885, 3rd ed. 1893; *Neutestamentliche Theologie*, 2 vols. 1891-2; *Christenlehre auf Grund des kleinen Lutheranischen Catechismus*, 1900; *Der Altkatholicismus*, 3rd ed. 1883; and an autobiography, *Aus meinem Leben*, 1896-8.

Beza, or de Beze, Theodore (1519-1605), one of the most influential and active of the foreign reformers, was born at Vezelay in Burgundy. He studied at Orleans under the learned Melchior Volmar, who both taught him Greek and also inspired him with his first leanings towards Protestantism. He studied law for some time, but gave himself largely to polite society and literature, these two influences producing his *Poëmata juvenilia*, a volume of loose verse published 1548, the thought of which later gave him great pain. In 1548 he had a severe illness, which brought about his conversion. He had already given up the idea of taking orders in the Roman Church, and now, after marrying his mistress, Claudine Denosse, he joined Calvin at Geneva, and became professor of Greek at Lausanne. In 1550 he published a drama on *The Sacrifice of Abraham*, and began a series of lectures on parts of the N.T., which ultimately led him to translate the whole of it into Latin. In 1559 he returned to Geneva, where he was professor of theology with Calvin. In 1561 he represented the Protestants at the Conference of Poissy, returning to Geneva in 1563. Next year Calvin died, and B. was called on to take his place as head of the reformed churches of France and Geneva. In 1571 he presided over the synod of La Rochelle. His best known works are an edition of the Greek Testament, *De Hæreticis a civili magistrato puniendis*, and the doubtful *Histoire ecclésiastique des Eglises réformées au royaume de France*. Beza's Codex, the Codex Bezæ, or Codex D, is a Greek MS. of the N.T. in uncial characters, dating from about the 6th century. B. pre-

sented it to the university of Cambridge in 1581, with a rather untrustworthy account of its history. See *Lives* by Schlosser (1806), Baum (1851), Heppe (1861), Baird (1899).

Bezant, or **Byzantine**, was the name of a coin of the Byzantine empire. They were made in gold and silver; the value of the gold B. varied from ten shillings to a sovereign, that of the silver B. from one to two shillings. They were not made in the same impression as earlier Roman coins, and in several cities where the Byzantine standard was adopted they were copied. Owing to the commercial relations which the Byzantine empire then had they were distributed over the whole surface of the known world. They were in use in England and India until the reign of Edward III. The fact of their being brought home by crusaders led to their use in English heraldry, for which *see* BEZANT (heraldry).

Bezant, in heraldry, belongs to the group of roundels or pellets, discs or balls of different colours. The name B. is generally confined to the golden roundel, though occasionally the silver roundel is included. In olden times it was considered that the B. and the silver roundel, as representing coins, should be drawn as a flat surface, the other roundels being drawn as balls. The arms of Beulay of Wharfedale were 'gules a bezant.' For further particulars *see* under HERALDRY.

Bezdan, a tn. of Hungary, co. of Bács-Bodrog, on a canal joining the Danube and the Theiss, very near the former river. Pop. 8400.

Béziers, cap. of an arron. in the dept. of Hérault, on R. Orb and Canal du Midi, is beautifully situated on the slope of a hill. It contains interesting architectural monuments, of which the chief is the early Gothic cathedral, rebuilt in the 14th century. The town also possesses remains of Rom. occupation in the ruins of an aqueduct and an amphitheatre. In 1209 the town, which was a centre of the Albigenses, was visited by Simon de Montfort and the inhabitants were put to the sword. In later times it was a centre of the Huguenots. It manufs. silk and woollen goods, brandy, wines, chemicals, etc. Pop., the growth of which has been rapid of late years (1900), 4900.

Bézique (corruption of Fr. *bésigue*, origin uncertain), a game at cards which, under varying rules, may be played by two, three, or four persons, the number of packs being the same as the number of players. All cards below seven are taken out of the packs, and the cards remaining rank in the order of ace, ten, king, queen, knave, nine, eight, seven. The game is generally played by two persons. When the lower cards have been removed, the two packs are shuffled together so as to form one. The dealer then deals eight cards to each player, dealing three, two, three, and the cards that remain are laid on the table between the players, forming the 'stock.' Trumps are fixed either by turning up the top card of the stock or by the suit of the first marriage or sequence (*see* below) which occurs during the game. The non-dealer then plays the first card, and the second player is not compelled either to win the trick (which he can do by trumping or by playing a higher card of the same suit) or to follow suit. Unless he has something to declare, he will probably avoid winning the trick. After each trick, each player takes a card from the stock and places it in his hand, the winner taking the top card. This continues until only two cards remain in the stock. The trick that follows is called the 'last trick,' and after the stock is exhausted the last eight tricks are played under different rules. But before explaining these, the system of scoring and the rules for declaration must be given. It has been seen that the aim in B. is not to gain tricks. It is (1) to secure certain combinations of cards in the hand, which, when declared, add to the score; (2) to gain in play brisques, *i.e.* as many aces and tens as possible; (3) to win the 'last trick,' which, as explained above, is *not* the last trick of the game. Scores are gained as follows: *Marriage* (king and queen of any suit), 20; *Royal Marriage* (king and queen of trumps), 40; *Sequence* (ace, ten, king, queen, and knave of trumps), 250; *B.* (queen of spades and knave of diamonds), 40; *Double B.* (all the B. cards), 500; four aces (of any suits, whether duplicates or not), 100; four kings, 80; four queens, 60; four knaves, 40. These are all gained by declaration. Winning of last trick, 10. In addition to this, if the dealer turns up the seven when turning up for trumps, he counts 10. If the seven of trumps is in the hand, the player may either exchange it for the card turned up, or declare it and count 10. Lastly, at the end of play, each player counts up the number of aces and tens in the tricks he has won, and registers 10 for each.

A declaration is made by placing the cards on the table and played from only be done by the winner of a trick, immediately after he has won, before drawing from the stock. Two declara-

tions may be made at the same time, if the cards of the second declaration do not include any of those used in the first. They cannot, however, be scored at the same time. One declaration is scored, and the other must wait until another trick has been won. In making declarations at least one card must be used which has not already been declared in any combination, while the rest may have formed part of previous ones. For example, a marriage having been declared and another trick won (for, as said above, two declarations can be made at the same time only if the cards of the two are distinct), three other kings may be laid down, and 80 scored for the four kings. But if four kings have been declared at one time and four queens also, it is impossible to combine one of these four kings with one of the four queens to gain a marriage. To gain all the scores possible on these cards, one set of four should be first declared, then the marriage or marriages, and lastly the other four. Of course, if the four queens exactly coincide in suit with the four kings, only three marriages should be scored, the last 20 being sacrificed for the sake of the 40 gained by the set of four queens. The winner of the 'last trick' may declare anything he has undeclared, but after this no more declarations may be made. Hence the additional importance of the last trick. When the last cards of the stock have been taken, all cards on the table are taken up. (The winner of the last trick takes the last card of the stock, while the loser takes the turned-up card.) After this the winner leads, and now the second player must always follow suit and win the trick if he can do so. If he revokes, or loses the trick when he might have won it, the whole eight tricks go to his adversary. The deal goes on alternately until one of the players has scored 1000. This closes the game. If the loser has scored less than 500 points, the game counts double. Scores are generally kept on a special B. marker. Three and four-handed B. are played under almost the same rules. All play against each other, and triple B. (counting 1500) may be scored. A player may also gain a second double B. by combining a B. combination with two cards of a double B. he has already declared. In four-handed B. the players may form partners, declarations may be made after a win by either partner, and Bs. may be from either hand. Other forms of the game are Polish (or open) and Rubicon Bézique.

Bezoar, or Bezoar Stone, a concretion or hardened mass occasionally found in the stomach or intestines of ruminating animals, as goats, llamas, antelopes, cows, chamois, etc. The name is of Persian origin, and means 'antidote to poison,' the stones obtained from the Persian wild goats being at one time much esteemed in that connection. They appear to be formed through the presence of some irritating substance in the alimentary tract, and in the Persian goat are composed of ellagic acid. The Oriental B. is found in the intestines of the gazelle and other animals, and is sometimes used as a form of incense, the substance burning with a resinous odour. Balls of hair are found in the intestines of British cattle, but these have little or no superposed accretion. The term is sometimes applied to the fossilised dung of extinct animals found in the Lias beds of Gloucestershire.

Bezold, Wilhelm von (1837-1907), Ger. meteorologist, born in Munich; educated there and at Göttingen; became a professor at Munich University in 1866 and later in the Technical Institute of that city. In 1885 he was appointed professor of meteorology at Berlin and also director of the New Meteorological Institute. He has pub. sev. valuable works on meteorology and thermodynamics.

Bezwada, a tn. in Madras, British India, on the l. b. of the Kistna, 44 m. N.W. of Masulipatam, a rapid growing centre for riv., canal, and railway traffic. Pop. over 21,000.

Bhagalpur: 1. City of British India in Behar prov. of Bengal, in dist. of same name, on r. b. of Ganges, 265 m. by rail from Calcutta. Pop. (1901) 75,760. 2. A dist. in prov. of B., divided into two nearly equal divs. by the Ganges. Lowlands are fertile and well cultivated. The chief manuf. is indigo, and rice and other cereals are well cultivated. Area 4226 sq. m.; pop. (1901) 2,088,953. 3. Div., comprising five dists., of which above is one. Area about 20,000 sq. m.; pop. about 8,720,000.

Bhagavad-Gītā ('The Song of the Blessed'), a famous religious and philosophical poem of India which is inserted as an episode in the sixth book of the Mahābhārata. It begins with describing the state of war between the two tribes of the Pāndus and the Kurus. The two tribes are closely united in blood, and this renders Arjuna, chief of the Pāndus, unwilling to slaughter his adversaries. But Krishna is with him in the form of his charioteer, and now recalls him to his duty, and instructs him in the work of a warrior. As the instruction continues it becomes more and more elevated and mystical, until at last Krishna reveals himself as the

Supreme Lord of creation. The work is the greatest ethical product of Indian philosophy, but there is much confusion of elements caused by the [illegible] work has [illegible] and mono- with high ain aim of y of mystic souls to the Yoga or absorption in the Deity, w[illegible] highest aim of [illegible] recen- sion of [illegible] s of the influence of Buddhist and possibly even of Christian thought. *The Song Celestial* is a translation or paraphrase of the B. done into blank verse by Sir Edwin Arnold.

Bhagirathi: 1. One of the chief head-streams of the Ganges, rising on the western slopes of the Himalayas. It is regarded as sacred by the Hindus. 2. A branch of the Ganges which flows past Murshibad. Later it takes the name of Hoogli and forms one of its principal outlets.

Bhainsror, a fort and tn. on the top of a high rock in Rajputana, Vdaipur, India. Famous for remains of temples to Siva.

Bhamo, a tn. of Burmah, on Upper Irawadi, 40 m. W. of the Chinese frontier. It has lately become important on account of its position as a centre on the trade route to the Yunnan prov., to which an Anglo-Chinese convention in 1893 gave special trading rights to Britain. Its chief industry is the transit of goods. Pop. about 7000.

Bhandara, cap. of dist. of B. in Central Provs., British India, about 35 m. E. of Nagpur; pop. about 13,000.

Bhang, the native Indian name for the hemp plant, *Cannabis indica*, but generally applied to a narcotic drug formed from its dried leaves. It is used sometimes for smoking either alone or with tobacco, sometimes it is strained in water to produce an intoxicating drink, sometimes it is used for chewing. It is in common use about the Indian races, and also among the Arabians [illegible] In addition to the u[illegible] effects, it produces [illegible] hallucinations, in the same way as opium.

Bhanpura, a tn. of British India, prov. of Indore, on the Rewa; pop. about 15,000.

Bhartpur, or Bhurtpoor, a state in Rajputana, British India, governed by a rajah under British protection. The surface is generally level and fertile, but the country suffers somewhat from lack of water, being traversed by only one river. Its rajah figured largely in the Indian Mutiny. The cap. of the state is the tn. of B., 35 m. W. of Agra by rail. Its immense mud-walls, still remaining, proved valuable on the two occasions when it was besieged during the Mutiny. Pop. (1901) 43,600. Pop. of state 630,000; area 1975 sq. m.

Bhartrihari, the name of a celebrated Indian poet who is supposed to have lived during the 1st century B.C. The best known work attributed to him is a collection of apothegms, arranged in three centuries or groups of a hundred. It is probable that they are the work of various hands, attributed in the general way to a well-known author. The first century deals with love, the second with ethics and morality, the third with asceticism, and devotion to the Divine Being. A critical ed. by Bohlen appeared at Berlin in 1833.

Bhatgaon, or Bhatgong, a tn. of Nepaul, 5 m. S.E. of Khatmandu. It is a favourite residence of the Brahmans. Pop. probably about 30,000.

Bhatkal, a tn. in the S. of Bombay, British India, 80 m. N. by W. of Mangalore. Was a prosperous mart from 1300-1600. Pop. 6000.

Bhau Daji, or Ramkrishna Vital (1822-74), Indian physician. A Saraswat Gond Brahmin, born at Mandra, Goa; educated in Bombay, and became a teacher in the Elphinstone School; studied medicine at the Grant Medical College, 1845-50. He was a popular and successful practitioner, a member of numerous educational and scientific societies in Bombay, a fellow of the University, a J.P., and a sheriff of Bombay. He did some valuable research work in connection with Indian drugs and the cure of leprosy.

Bhaunagar, or Bhavnagar, cap. of state of same name in Bombay, on Gulf of Cambay, 60 m. N.W. of Surat. It is an important port. Pop. 56,500. The state has an excellent administration, and its prosperity is now increasing somewhat. Area 2860 sq. m.; pop. 420,000.

Bhavabhuti, an Indian dramatic poet who flourished at the beginning [illegible] 8th century of our era. He of an illustrious Brahman and is the author of three Sanskrit dramas which raise him to the level of Kālidāsa and Harsha. The three are the *Maha-vira-charita*, *Uttara-rāma-charita*, and *Mālati-Mādhava*, the story of the two first being drawn from the legend of Rama. All three have been trans. into English separately.

Bhavani-Kudal, a tn. of Madras Presidency, British India, on Bhavani and Cauvery rivs., 58 m. N.E. of Coimbatore, containing temples to Vishnu and Siva; pop. 10,000.

Bhera, a tn. on the Ghelum, in the

Punjab, British India; dist. Shahpur; pop. 17,500.

Bhils, an aboriginal, pre-Aryan people of Central India, found scattered over the hilly dists. there, but especially in the Khandesh dist. of Bombay and the Vindhya Hills. They were driven out of the fertile districts by the Aryan invaders, and henceforth led the wild, nomadic life of outlaws. An unsuccessful attempt having been made to subdue them, the Bhil corps was formed in 1825 to utilise their fighting instinct, and this corps secured some order in their dists. The Bhil is short, dark, active, and a great woodman; he is brave but superstitious. Civilisation is gradually getting some hold on the Bhils. They number about a million.

Bhilsa, a tn. of India, on the Betwa riv., 26 m. N.E. of Bhopal. It grows a coarse tobacco, in which it carries on some trade. To the S.E. of B. is Sanchi, remarkable for a famous group of Buddhist topes, chief of which is the Great Tope. B. itself also possesses some of these buildings.

Bhima, a riv. of India, 398 m. long, rising in Bombay. After flowing through Haidarabad, it joins the Kistna near Muktul.

Bhir, a tn. on Pandsura R., in Haidarabad, British India.

Bhiwani, a tn. in Hissar dist. of Punjab, 38 m. S.E. of Hissar by rail. Important commercial centre, with trade in salt, spices, and metal goods. It has grown considerably of late. Pop. 36,000.

Bhojpur, a tn. of Shahabad dist., Bengal, British India, 8 m. E. of Buxar; pop. 10,000.

Bhopal, a state of Central India, founded in 1723 by Dost Mohammed Khan. In 1818 a treaty of dependence was concluded between Britain and this state, which had always shown itself friendly. Since then it has been thoroughly loyal. It is crossed by the Vindhya Hills, and is hilly but generally fertile. The cap., also named B., 325 m. S.W. of Allahabad, has an important trade in opium. It is watered from two large artificial lakes in the dist. Pop. 77,000. Pop. of state 665,960; area 6900 square miles.

Bhor: 1. Feudatory state of Bombay Presidency, British India; area 1491 sq. m.; pop. 140,000. 2. Cap. of above state, 30 m. S. of Poona; pop. 4200.

Bhor Ghat, a pass across the Western Ghats, in Bombay, British India. The railway, built up it in 1863, communicates with S.E. India.

Bhownagree, Sir Mancherjee Merwanjee (*b.* 1851), born in Bombay, the son of a Parsee merchant; educated at Elphinstone College and Bombay University; became sub-editor of the *Statesman* in 1871. In 1873 he became state agent in Bombay for the Bhaunagar Maharaja, and in 1881 came to England to study law, being called to the bar in 1885. In 1886 he was created Companion of the Most Eminent Order of the Indian Empire. During 1887-91 he was engaged in assisting the Maharaja of Bhaunagar to establish various constitutional and judicial reforms. In 1895 he entered parliament as Conservative member for Bethnal Green. He was created K.C.I.E. in 1897. Author of *History of the Constitution of the East India Company*, 1871, and a Gujarati translation of Queen Victoria's *Life in the Highlands*.

Bhuj, cap. of the state of Cutch, British India. The tn. has a pretty appearance on account of its white-topped mosques and pagodas. Pop. 26,000.

Bhurtpoor, *see* BHARTPUR.

Bhusawal, a tn. in the dist. of Khandesh, in Bombay, British India, 115 m. S. of Indore; pop. over 13,500.

Bhutan, an independent state in the Eastern Himalayas, bounded on the N. by Tibet, on the E. by various unimportant independent mt. states, on the S. by Assam and Bengal, on the W. by the independent state of Sikkim. The surface is extremely varied, and B. presents a series of lofty, forest-clad mt. ranges, alternating with deep-cut valleys. Through these valleys swift rivers run in a southerly direction, ultimately joining the Brahmaputra. The chief of these are the Mānas, the Machu, and Chinchu. The dist. has only lately been explored, and in 1904 an expedition was sent there which did much valuable surveying work. There are two supreme chiefs of the state, the Dharm rajah, head in spiritual matters, and the Deb rajah, head in temporal affairs. They are not hereditary rulers, and the rule practically rests with the council, known as the Lenehem. Rule, however, is very loose, and commerce is poor. The Bhutias are industrious, and very clever joiners, their agric. produce being their chief exports. Among these are the famous horses, mules, native cloth, salt, etc. Nominally the religion is Buddhism, but it generally amounts to little more than the propitiation of the evil spirits. The area of the state is estimated at about 15,000 sq. m., and the pop. at about 200,000. Chief tns. are Tassisudon and Punakha.

Bhuvaneswar, or Bhobaneser, city of Puri dist., Bengal, British India, 16 m. S. of Cuttack. While largely in ruins, it has a temple to Siva, and a

trade in cloth and rice. Former cap. of Resari dynasty of Orissa.

Biafra, Bight of, a bay on the W. coast of Africa, on that part of the Gulf of Guinea lying between Cape Formosa on the N. and Cape Lopez on the S. It contains the is. of Fernando Po (Spanish), Prince's and St. Thomas (both Portuguese). Into it flow various important rivers, the Niger, New Calabar, Old Calabar, Rio del Rey, Cameroon, and Gaboon.

Biala: 1. City in Galicia, Austria-Hungary, on the riv. B., 43 m. W.S.W. of Cracow. Has linen and woollen manufs. Pop. 9500. 2. Tn. in Russian Poland, in the gov. and 34 m. E.S.E. of Siedlce, on the main line between Warsaw and Moscow. Pop. 14,000.

Bialystok, a town of European Russia, in the gov. of Groduo, situated on the R. Biala. It has manufs. of *silk goods* and *hats*, and a trade in grain and manufactured products. It belonged to Prussia from 1795 to the time of the treaty of Tilsit in 1807, when it was ceded to Russia. It is the centre of the dist. of the same name having a pop. of 170,000, and has itself a pop. of 68,000.

Biana, or Bayana, a tn. of British India, state of Bhartpore, near l. b. of the Gambhir riv. It contains two anct. Hindu *temples*, and in ages past was a city of great importance. Pop. (1901) 6867.

Biancavilla, a tn. Sicily, 20 m. N.W. of Catania, on the southern slope of Mt. Etna. The dist. produces wine and grain, and much cotton-stuff is made and exported. Pop. 13,000.

Bianchini, Francesco (1662-1729), Italian astronomer, born at Verona. He was a favourite of Pope Alexander VIII., whose librarian he had been, and continued in favour under Clement XI., who made him secretary of the *committee for the reformation of the Calendar*. He wrote several works of astronomical and archæological interest, and an *Istoria Universale*, 1697.

Bianco, or Biancho, Andrea, It. cartographer of the 15th century, born at Venice. His collection of hydrographical charts includes a map dated 1436, in which two islands, named Antilla and Man Santaxio, are placed W. of the Azores, suggesting a knowledge of America previous to the voyages of Columbus.

Bianconi, Charles (1786-1875), an It., migrated to Ireland. After accumulating a small capital by hawking prints, he instituted in 1815 the first public conveyance between Clonmel and Cahir. The time was propitious, the market was crowded with horses and cars in consequence of the carriage tax. In 1865 B. retired, having amassed a considerable fortune. His cars covered as much as 4000 m. daily.

Biard, Auguste François (1798-1882), celebrated Fr. *genre* painter, born at Lyons. In his early years he travelled in the Mediterranean and the Levant, and his later pictures show plainly the influence both of this journey and of one which, in 1839, he made to Greenland and Spitzbergen. In 1859 he visited Brazil. Among his best known paintings are the 'Beggar's Family,' the 'Slave Market,' the 'Fight with Polar Bears,' the 'Wandering Players,' and the 'Mad-house.' In addition to this type, on which his fame chiefly rests, B. also painted some historical scenes.

Biarritz, an important watering-place of S.W. France, dept. Basses-Pyrénées, on Bay of Biscay, about 5 m. W.S.W. of Bayonne. Under the patronage of the Emperor Louis Napoleon, or rather of the Empress Eugénie, for whom that monarch erected the Villa Eugénie here, B. rose from a small fishing vil. to a large tn., and since then its prosperity has been continuous. It depends for its prosperity entirely on its visitors, for it has no important industries. The air is salubrious, and the country pleasing. It has two casinos, luxurious *villas* and *hotels*, *bathing*, *golfing*, etc. Pop. (1906) 13,629.

Bias (*c.* 550 B.C.), son of Teutames, born at Priene, in Ionia, was one of the seven sages of Greece. He became a distinguished citizen of his native town, and many of his epigrams have been preserved. The stories associated with his name, such as his persuasion of the Ionians to settle in Sardinia, are probably unauthentic.

Bib, Whiting-pout, or Brassy are popular names of the *Gadus luscus*, a fish belonging to the family Gadidæ and of the same genus as the cod, whiting, and haddock. It is about a foot long and less than five pounds in weight. It occurs in the North Sea and Arctic Ocean.

Biban-el-Moluk, a valley of Upper Egypt, near ruins of Thebes, in which are the tombs of the anct. Egyptian kings of the 18th, 19th, and 20th dynasties.

Bibbiena, a tn. in the prov. of Arezzo, in Tuscany, Italy; pop. of commune, 8000.

Bibbiena, Bernard Dovizio (1470-1520), an It. cardinal, was the son of poor parents. Having entered the service of Cardinal Jean de Medici, he followed him to Rome after the death of Alexander VI., and was there entrusted by Pope Julius II. with sev. important commissions. When his patron, the Medici, became pope in his turn, he presented B. with his

cardinal's hat in the year 1513, and ten years later despatched him to France as *pope's legate*. On his return to Rome he died suddenly, his death having been accelerated by a heated argument with the pope, who accused him of intriguing to succeed him in the papacy. He had a lively interest in the progress of literature, and himself wrote plays in the manner of Terence.

Bibby Steamship Line. This line has traded with India for over a century, having been founded by John Bibby in 1807. The fleet now consists of eight twin-screw steamers, averaging about 8000 tons gross, all built at Belfast by Harland and Wolff, and registered at Lloyd's. They carry cargo and first-class passengers, and run principally to Southern India, Ceylon, and Rangoon. Chief offices, 26 Chapel Street, Liverpool, and 10 Mincing Lane, London, E.C.

Biberach, a tn. of Würtemberg, on the R. Reiss, 23 m. S.S.W. of Ulm. In 1796 Moreau defeated Latour here, and St. Cyr defeated Cray in 1800. A monument to Wieland, who was born in the vicinity, has been erected in front of the theatre. B. manufs. machinery, leather, toys, etc. Pop. 9000.

Bible, The. The name B. comes to us from the Gk. *τα βιβλια*, which means the sacred books. In the original Gk. it is a plural form, but was treated because of its ending as a singular noun in mediæval Lat., and as such has passed into most of the modern European languages. The B. consists of two great parts, the one the Old Testament, the other the New. In the O.T. is given the records of the covenant between the God of Israel and his chosen people the Hebrews, a covenant which, being proved to be insufficient, was to be increased by a New Covenant which is distinctly promised by the prophets, and which is founded by the life, teachings, and death of the Lord Jesus Christ. Christ himself speaks of the new dispensation which was to be the New Covenant. In the early Christian Church the two divs. of the B. were known respectively as the Old and the New Covenants. The word Covenant was rendered incorrectly by the Lat. word *Testamentum*, and so has passed in the language of the modern world for the two divs. of the B., the Old and the New Testaments.

The religion of the Hebrew race was a national religion—a religion which affected the state as a whole, in which the individual was unimportant. This national religion which bound them together, and this sense of unity, had come to them with the exodus from Egypt. From the time of the founding of the theocracy by Moses, the people had been bound into one united whole. Israel was conscious of her sacredness and singularity as a people from the time that the promise had been sounded from Mt. Sinai: 'I am the Lord thy God, which have brought thee out of the land of Egypt, out of the house of bondage.' In this way and for this reason the literature of Israel reflects the history of the people, and this history shows us a people now carried away by the enthusiasm of its ideals, now still convinced that it is a chosen people, but chosen by a God whose care was for Israel alone, and was independent altogether of moral conditions. The history of the children of Israel is very much the history of a people whose course continually varies from the dark to the bright.

Historic tradition, which is essentially the feeling of a united people, traced the descent of the race from earliest times. The race had originally come from the E., had in the fulness of its power gone into Egypt, until there rose a Pharaoh who knew not Joseph, and then the period of their terrible oppression follows. That they were not a united people then is obvious from the history of their Egyptian sojourn, but with the release from Egypt and the march to the promised land we get the beginning of that feeling of national unity, a unity which in their case was bound up altogether with their religion. They were, however, in no sense a united nation as nations are united at the present time. They came from their wanderings in the desert to the promised land, but from the death of Joshua to the time of the prophet Samuel, their unity is broken by constant warfare between the tribes; and with the vanishing of the common danger which had welded them together we get also the vanishing of the common spirit of unity among the people. The book of Judges reflects the broken unity of the children of Israel, and shows us the people divided amongst themselves, and united only in the face of common dangers. But through the whole of this unsettled period we find that the tradition of unity lives on, especially in the minds and hearts of the greater men amongst the tribes, and this idea of national unity leads to the desire for a king who shall be to Israel the symbol of their unity and the anointed of God. Up to this time the centre of the monotheistic religion of the Hebrews was the sacred ark and the priesthood. This priesthood was essentially aristocratic and conservative, and was at this period supplanted

by the power of the prophets. The essential differences between priesthood and prophecy are that priesthood naturally tends to conserve all that has been regarded as good and great in religion, but makes little forward progress; prophecy, on the other hand, is essentially direct inspiration from God, by which religion is portrayed to the prophet in a new light and as a practical solution of the problems which were troubling the men of the day. The first of the great Israelitish prophets was Samuel, and from his time we trace the beginnings of many of the great movements of the history of Israel. In fact, to a very great extent, it is true to say that the spiritual tradition which runs so obviously through the O.T. and to which the N.T. is linked up, takes its beginning in the work of Samuel and from his inspiration. Samuel was himself a priest, but is important in the history of Israel as a prophet.

A new danger had arisen which it was necessary for the Israelites to face as a united race. The incursions of the Philistines meant for them the renewal of the demand that they should have a king who would lead them in battle as a united nation. Samuel had perhaps more than any one the ideal of a united nation, but did not altogether relish the idea that an ideal which he cherished of a nation united by the worship of Jehovah should be actually united by the headship of an earthly king. But he was also wise enough to realise that for the preservation of the children of Israel as a nation it was necessary that they should have a king, and accordingly he gave them Saul. Then came the disobedience and downfall of Saul and the elevation of David, in this way beginning the great Davidic dynasty. The foundation of this dynasty was one of the great features of this period, since from the greatness of that race sprang the greatness of the Jewish empire and the foundation of a great ideal in the eyes of the people. Under the brilliant rule of David the Heb. race became a great nation, the rulers of a great empire, an empire which became their ideal. During the days which followed the downfall of the Hebrews, during the black days of their captivity, they regarded the period of the Davidic empire as a period to be looked back to and revered and reverenced as the greatest period of their rule. But they did also more than this: the recollection of their bygone greatness gave them the vision of a still greater kingdom which they would found with the Messiah as their leader, and so the days of the kingdom of David came to be regarded as the forerunner of the time when they should rule all the world. The ideal of the universal kingdom of God which their Messiah was to found was the outcome of the greatness of the temporal kingdom of David. This period of temporal greatness had also other effects as far-reaching as the former: from this time the history of Israel is bound up to a very great extent with the history of her prophets. The magnificent conceptions of the spiritual religion of the children of Israel to be found in the literature of the O.T. takes its rise from this period. Prophets had probably been in existence in Israel as long as the priesthood itself, but they had probably dwelt apart, and had taken no very great part in the life of the people. From this time forth we get, however, the prophetic writings of the prophets, giving us the best conception of the greatness and wonderfulness of the religion of Jehovah and leading up to the N.T. and the new dispensation which is actually joined up to these wonderful writings. Another effect this period had was to make Jerusalem the city of God and the centre of the national and religious spirit of the Heb. people. The heart of the people turns naturally in captivity to 'Zion,' the city of David, and Jerusalem becomes the symbol on earth of the heavenly city in which is the throne of Jehovah himself. The final view which must be taken of this short sketch of the history of the O.T. is the outcome of rivalry between the northern and southern tribes, leading to the division of the kingdom into two, Israel and Judah. In the main, although at times unfriendly, the general tendency of the two kingdoms is to remain on the best of terms. For a time they are able to subdue the smaller kingdoms which surround them, to offer steady resistance to the larger kingdom of Syria, but with the rise of the greater empires of Assyria and Babylon the two kingdoms fall and the captivity begins. The shame, the horror, the self-contempt which was felt by the race for themselves is evident in the writings of the O.T. They felt that the idolatrous departures from the worship of the God of Israel had been punished only too deservedly by their exile and captivity, but throughout it all runs the idea that God will not leave them to perish ignobly in their chains, but will restore his chosen people and make them a great race with the coming of the Messiah. But with their first captivity ends their era of greatness as an independent nation; no longer are they to glory in the fame of their Davidic kingdom no longer are they a great empire

Empire succeeded empire, Babylon, Persia, Greece rose and fell, but the Hebrews remained as a race dependent upon their successive conquerors. Only for a century did they restore themselves as an independent race, and then again they fell before the rising tide of the great Rom. race. They were self-governing, that is, they governed themselves according to the law of Moses, but they were always the inferior, the conquered race. Such is the later history of Israel, a history which takes us up practically to the destruction of Jerusalem (their Zion, the city of David, and the prototype of the city of God) by the Roman legions in A.D. 70. But it is necessary to emphasise here the fact that through it all there runs a continuous literature, a literature which never ceased, and in which is reflected the fallen glories of the Israelites, the contempt in which they held themselves, their deservedness of such a terrible punishment, but above all the idea that the God of Israel was still the God who would deliver them out of the house of bondage.

The main division of the B., as has already been pointed out, is into two great divs., the O.T. and the N.T. The O.T. is divided in the Eng. language into thirty-nine books, in the Heb. B., however, the div. was only into twenty-four, 1 and 2 Kings, 1 and 2 Samuel, 1 and 2 Chronicles, Ezra and Nehemiah, and the twelve minor prophets being respectively counted as one book. This div. is not altogether stationary as far as the Heb. B. is concerned, the number being reduced by Josephus and increased by Ephiphanius. The books were grouped together into three main groups or divs. The first the Torah or the Law, the second Nebiim or the Prophets, and thirdly the holy writings of Kethubim. The Torah consists of the books of Moses or the Pentateuch; the writings of the prophets include the historical books, or the former prophets and the latter prophets, that is the prophetical writings proper; while the poetical books comprise, in addition to the Psalms, Proverbs, and Job, the five rolls, Ruth, Lamentations, Ecclesiastes, and Esther, together with the books of Daniel, Nehemiah, and Ezra.

The law books of Moses, and the historical books.—The tradition of the Jews ascribes to Moses the writing of the first five books of the B., to Joshua the book named after him, and to Samuel the books which take their name from him. Since all Jewish authorship was anonymous, it is obvious that this classification is mere conjecture, and a more detailed examination of the case shows that the question of authorship, not regarded as important amongst the Jews, is infinitely more complicated than it appears. Throughout the whole of the Pentateuch there are differences of style and language which show themselves also in the book of Joshua, and which prove obviously that the books were not all written by the same hand, and that it was not all written at the same time. All this simply proves that it is futile to attempt to base the authorship upon the classification already given, for that all the evidence which we have goes to prove that the books of the Pentateuch and the book of Joshua, which cannot well be separated from the previous five books, are not subsequent narratives, but a series of independent narratives which have been carefully collected and edited by one man. This view is supported also by the facts that sev. incidents are related more than once, and that many of the laws are repeated. Whenever reference is made to the name of Moses he is referred to as a prophet, *i.e.* a man who spoke to the people from God. But it is hardly to be credited that the books of the Pentateuch, which comprise a highly-organised priestly ritual, should have come in their present state from the hand of the prophet himself. In a close examination of the Pentateuch it became obvious that a part of it gave evidence of being pre-Mosaic: references were made to kings who ruled over the land of Edom before the children of Israel had kings; there were, as has already been pointed out, many parallel and double references, and one of the authors had a strong bias in favour of the priestly section of the community, devoting a great part of his writings to matters affecting the ritual of the Hebrews. All these points were noticed by a Belgian physician of the name of Astruc, who formulated a theory which seemed both sound and plausible. The div. which he made corresponded with the div. that was emphasised by the writings, some of which were prophetical in tone, the others adopting the attitude of the priest. Astruc concluded that the difference corresponded with the employment of the term Jehovah (Lord) and Elohim (God). Exodus vi. 3 states distinctly that the name Jehovah was a name the employment of which only came into being with the exodus. 'And I appeared unto Abraham, unto Isaac, and unto Jacob, by the name of God Almighty, but by my name Jehovah was I not known to them.' Accordingly, in this way the writings of the Pentateuch were divided

according to their sources in Elohistic and Jehovistic writings. The name 'God' was taken as showing that the employment of that term indicated the earliest or primary writings, while the term 'Jehovah' was used in what were regarded as supplementary writings. In this way rose the theory of the supplement-hypothesis. Hupfield proved practically the existence of a third writer who agreed largely with the Elohistic writer, but was also in many places widely different from him. He also expressed the opinion, which found wide acceptance, that the writings of this third author and of the 'Jehovah' authority were not supplementary, but were altogether independent writings. The three writers who have been mentioned obviously interpret three different tendencies, three different points of view. We have distinctly the writings of the prophetical mind, the priestly mind, and the mind of the layman. How these three points of view came to be united together into one set of writings is only explicable when we remember the usual manners and mannerisms of the Heb. copyist and the usual tendency of the Heb. genius. The order of the writings seems obviously to be the Book of the Covenant, followed by Deuteronomy, followed by the code of the priests, which is obviously the outcome of the time when the priesthood had assumed the position of a ruling caste, that is, after the Restoration. The books of the Pentateuch can best be regarded as the outcome of the combination of writings of various periods in the history of the Jews, combined together and probably added to by the copyist [illegible] writings. The H [illegible] mself a great [illegible] nce he copied [illegible] authorities and gave any necessary harmony by his own additions. Almost all the writings of the O.T. may be regarded as compilations from various sources. The main idea running through the Heb. mind was the addition of part to part, not the development of a single idea, and this is fully exemplified in their genius of architecture, in the poetical books and the books of the law, and the historical books also.

The poetical books. — The general tendency of the Hebraic mind was not to express abstract ideas, but to use the medium of personal action and desire for the expression of feeling. The reduction of all experience to personal standards is reflected throughout the whole of the poetical books. To view things from the point of view of a theory only was to be almost impossible; they expressed themselves as the subject in question impressed them personally, and not in relation to the subject apart from its effect on them. The poetic structure of these books remains very much unchanged from [illegible] the Hebraic [illegible] down to the [illegible] sisted not of the fall of accent or the quantity of the syllables, but in a rhythm of the sense alone, a rhythm best known as a sense rhythm or parallelism. The authenticity of the Psalms as we have them at the present time is, as with the historical book, open to very grave doubts and very obvious criticisms. The Psalms which are ascribed to David, Asaph, and Solomon, to name only three of the important authors given in the book itself, cannot be regarded as being strictly correct. The tendency is always to ascribe some ancient and honoured name to them, but while it is impossible to believe the authorship in every case, it is also wrong to deny any Davidic origin to any of the Psalms. A number of them undoubtedly originated with David and with the other authors to whom they are ascribed. But as with the historical books, it is impossible to overlook cases of parallelism, as *e.g.* Psalm xiv. and Psalm liii., where it is impossible to come to any conclusion except that the copyist has again exercised the undoubted licence which he allowed himself. It is also impossible to agree with the conclusion that all the Psalms are of the great exile period, since we have many examples of earlier Psalms and songs in the B. We can, however, agree that since the period of the exile the Psalms undoubtedly became the means of expression of religious feeling for the whole of the Heb. race. Amongst the other poetical books to which a similar criticism can be applied is the book of Proverbs which proves the Hebrew a poet even in his philosophy. The greatest name in the wisdom of the Jews is undoubtedly Solomon, and to him is usually ascribed the book of Proverbs. That it is possible that Solomon contributed much of the wisdom of that book is undoubted, but the whole of it can certainly not be ascribed to him. The book of Ecclesiastes, another example of Hebrew poetic philosophy, was written probably some considerable time after the exile. The book of Job sums up the whole question of the religion of the O.T., the goodness and justice of God in relation to the merit of the sufferer. It asks the question why the lover of God is afflicted with grievous punishments, and the whole question is

debated and answered by the various speakers. Here too, however, an obvious interpellation can be noted in the speeches of Elihu who disconnects the argument, and whose speeches may be assigned to a very much later author.

The prophetical books.—The prophetical writings begin with Amos, after whom the succession of prophets is regular. The older school of prophets, Samuel, Elijah, and Elisha, left no writings, neither did the prophet Jonah, the book called after his name being only an episode in his life. The later prophets wrote down their teachings or doctrines which they had not spoken but wished to be known. The office of a prophet cannot be likened to the priestly office which was definitely appointed. A prophet was a man of the moment, a man sent by God, with whom God spoke, to whom God appeared, and who was given a definite message to tell to the people directly from God. He did not even of a necessity see into the future, he need not as a prophet foretell events, he was there in order to interpret to the people the various acts of God, and to guide them over a crisis in the affairs of the nation. That in almost every case he foretold of the joys and splendours of the heavenly kingdom is due to the fact that it was necessary, in order that the people should strive after the kingdom of God, that the image of that kingdom should be ever before their eyes, and that they should be continually reminded of the greatness and goodness of Jehovah.

The customary Jewish division of the prophets is the former prophets and the latter prophets. The former prophets were the records of Judges, Samuel, and Kings; the latter are the writings of the prophets of the later period. These again are subdivided into the greater prophets and the minor prophets. The books of the former prophets are distinctly historical books, written round the central characters of the period, and influenced by the earlier Hebraic writings. Judges is simply a compiled narrative completed and arranged by the compiler; Samuel, a book which centres round the doings of the prophet Samuel and the kings Saul and David. The book of Kings is again simply a compilation which, in conjunction with these other books, completes the history of the Jews from the entrance into the Holy Land down to the fall of Jerusalem. The latter major prophets consist of the writings of Isaiah, Jeremiah, and Ezekiel. The prophecy of Isaiah falls into two very distinct parts, the div. being chaps. 1-39 and chaps. 40-66. The latter is much later than the former, and even of the former it is now doubted whether Isaiah did actually write it all. The latter portion seems almost certainly to have been written just previous to the restoration, a century and a half after the original prophecies of Isaiah himself. Jeremiah's prophecies began during the greatness of the empire of Babylon, and were directed against the sins of the people; but while lamenting the awfulness of their sin and trying to turn aside the wrath which he saw must come, he eventually prophecies the restoration. Ezekiel flourished at the beginning of the 6th century B.C. He was carried off together with other exiles to Babylon, and from here he prophesied the coming fall of Jerusalem (586). Towards the end of his prophecies comes the prophecy of the future restoration of the nation, and he describes in detail the reorganisation of the restored nation. The twelve minor prophets were—as has been pointed out—regarded as the second div. of the latter prophets by the Jews, and also as a single book. The approximate dates of these minor prophets are: Amos and Hosea, 740; Zephaniah, 620; Nahum, about 600; Habakkuk, about the same time; Obadiah, after 586; Haggai, 520; Zechariah, 520; Malachi, 450; Joel, 5th century; Jonah, 4th century.

Canon of the Old Testament.—The word canon is Greek. In its original meaning it signified a straight rod or rule. In its scriptural application it probably means the books which were considered the standard books by the Hebrews. All the writings included in the canon were held by the Jews to be the direct inspiration of God. The Jewish canon was divided into three distinct parts. The Torah, or the Books of the Law; the Prophets, consisting of eight books—the former prophets and the latter prophets; and the Sacred Writings—the hagiographa—which consisted of the poetical books, the Rolls, and Daniel, Ezra, Nehemiah, and Chronicles. This div. represents probably the stages in the canonising of the various books. Since the closing of the whole canon by Ezra cannot be accepted, it is necessary to form an opinion from the internal evidence given in the books themselves as to the probable date when these three divs. actually became parts of the canon. The earliest canon seems to have consisted of the Torah, about 444 B.C., supplemented probably some two hundred years later by the prophets, and again one hundred years later by the hagiographa. The Heb. canon contained none of the books which form the Apocrypha. The Greek translation of

the B., the Septuagint, contained these, but they were pronounced against by Jerome at the end of the 4th century A.D. The old Lat. version and the Vulgate still, however, contained them, and the Council of Trent canonised them into the Catholic B. The Protestants of the Reformation, however, treated them in the same way as they had been treated by Jerome, and while acknowledging their utility as books of moral teachings, denied the divinity of their revelation. By the advanced sections of the Reformed Church, however, they have been entirely rejected, and the canon of the O.T. is to them identical with the canon of the Hebrews.

The text of the Old Testament.—The original form of the Hebrew text was purely consonantal. It was not until the 6th or 8th century that the pointed text was given us by the Traditionists or Massoretes. Hence *the name Massoretic text is given to* the MSS. from which our O.T. is derived. This probably only became fixed about the end of the second Christian century. The aim of the Massoretes was to preserve and hand down the text which had been handed down to them. To the end that the proper pronunciation of the text might be preserved, they added a system of vowel points and accents such as we now have. The oldest MSS. of the O.T. which we have only goes back to the beginning of the 10th century, although some of the writings included in that MSS. probably date back one or two centuries earlier. Further, all the MSS. which we have represent the same Hebrew text, *i.e.* the Massoretic. The chief versions of the O.T. which we have are the Targum, the Septuagint, and the Latin Vulgate. The Targum is a purely Jewish version, dating from the period immediately antecedent to the Christian era. The writings are certainly not earlier than the 4th century B.C. The text of the Targum is practically identical with the Massoretic text. The Septuagint was a Greek version of the Jewish canon for use by the Greek speaking Jews of Alexandria. Originally it contained only the Pentateuch, but the later [illegible] were afterwards added to it, so that by the 1st century it was regarded by the Hebrews and as such passed on to the Christian Church. There are also other versions of considerably less importance called by the names of Aquila, Symmachus, and Theodotion. The old Lat. version was in the 6th century superseded by the Latin translation of Jerome, to which the name of Vulgate was given. This Vulgate was translated during the later years of the 4th century. The new version was translated from the Heb., but use was also made by Jerome of the Gk. versions then extant.

The New Testament.—The period of Jewish history just previous to the birth of Christ had been a period in which the hopes of the coming of the Messiah had been raised and quickened. Some of the books of the Apocrypha, written during the last two centuries previous to the birth of Christ, had given full vent to this feeling. But at the outset it is necessary to state that the Jews did not put forward in any way the idea of a Christ who was to come and suffer death in this world. Still, the expectation of the coming of a Messiah was raised to its highest point just previous to the realisation of that expectation, which, however, passed without recognition on the part of the Jews themselves. The rise of the *literature of the N.T. did not come,* however, with [illegible] Christian rel[illegible] no writings; at first did [illegible] for a literature to instruct future generations in the truths which they themselves had experienced. To understand this we must realise that the early Christian believed in the immediate coming of the Lord. He looked forward to his release from this earth by the second coming of the Messiah, and this coming was daily, almost hourly, expected. Hence he did not see the necessity of writing down his experiences for generations who would not need them. The literature of the N.T. then arose because ultimately there arose a situation which needed a literature; it was *not written from any desire to emulate* the writings of the older Hebrew book. By undertaking his missionary journeys, Paul also undertook the necessity of creating a literature. When many small settlements of Christians grew up in all parts of the Roman world, it became necessary either to visit them personally or to substitute for that visit letters of advice and counsel. In this way and for this purpose were written the epistles to the Thessalonians, which are the oldest Christian documents which we have, and incidentally it should be noticed that both these epistles are written with the *immediate object of calming the agitation* which had arisen from a belief in the immediate second coming of the Messiah. In the various epistles which St. Paul addressed to the Christian colonies he developed his ideas of the doctrines of Christ, and puts forward his view of the teachings. Be-

yond the 'eschatological' views which were gradually beginning to subside, there was also now arising other views of doctrine which were a disturbing influence in the Christian Church, and which many of the Pauline epistles were written to rebuke.

The epistle to the Romans was a practical summing up of the gospel of St. Paul. He had planned a journey to Rome, but he knew that his visit to Jerusalem first was fraught with danger. Hence he sent his epistle to the Romans, in which we get a full and clear account of the Pauline doctrine. After this letter most of his epistles contain theories (Ephesians and Colossians are examples of this), but through most of these epistles runs his idea of the unity of the Church which was to unite both Gentile and Jew, 'that God might have mercy on all.' His epistles to Timothy and Titus are purely pastoral letters, written to his helpers when the charge of a church had been committed to them. The epistle to the Hebrews was not written by Paul, but probably by a disciple of his, or at least one greatly under the influence of his teachings. Many theories have been put forward; Barnabas, Apollos, and Luke all being given by different authorities as possible authors.

The other epistles of the N.T. are to a very great extent the following of the impulse already given by the 'apostle of the Gentiles.' They are usually known as the 'Catholic' epistles, a name given them since they were to appeal not to a special section of the Church, but to the 'universal' Church of Christ. The name Catholic also amongst the followers of the early Church was equivalent to the word canonical. First Peter was written for the Christians of the northern prov. of Asia Minor, who were probably at this time suffering from a persecution. The epistle of James is addressed to a much larger section of the community of Christians. The epistles of James and Jude were written by the brothers of Christ, the epistle of Jude being addressed to a section of the Christians who appear to have fallen under the influence of men who were making the propagation of the gospel the work of mountebanks.

The Gospels and the Acts. — The rise of the historical literature of the N.T. was probably delayed in much the same way and for much the same reasons as the beginnings of the epistolic literature. The early Christians did not consider it necessary to record the doings and sayings of Our Lord, they were simply awaiting the coming of the Messiah. Gradually, however, there would grow up a tradition of the life and sayings of the Christ; the apostles and disciples travelling from place to place, would begin to feel the necessity for some written account of the life of Christ. They were constant travellers, they tarried but little in one place, it was probably long before they returned. During their absence it was necessary that instruction of some description should be given to their converts and followers. Hence came the desire for a written literature which would give that instruction, and would contain the beginnings of the historical literature of the N.T. The constant intercourse of the disciples one with another, the recollection of the sayings and doings of Our Lord supplemented by one another, would give the necessary basis for a written account of the life of Christ, and would fix that life on definite lines.

Probably the earliest form of gospel that we have is to be found in the sayings of Christ which were written down in Hebrew by Matthew, and which are generally known as the 'Logia.' The writing of this 'Logia' is definitely confirmed by the statement of Papias, and it forms the core of the gospels of St. Matthew and St. Luke, This 'Logia' did not supply the full needs of the Christian community, it in no way professed to be a complete record of the life of Christ, but it was for this complete record of the life of Christ that the Christians, as their hope of the immediate coming of the Messiah grew fainter, wished. And St. Mark, supplementing the tradition already held by the teaching of St. Peter, gave us our first complete gospel. This was written at Rome, probably between the years A.D. 64-70. The gospel according to St. Matthew was in reality simply the 'Logia' together with the gospel according to St. Mark, and in the course of time this gospel superseded almost entirely the use of or the need for the original 'Logia.' St. Luke's gospel is written largely from the historical point of view. It is addressed to a particular individual; it is composed of very much the same materials as the gospel according to St. Matthew, but is supplemented by the author from other sources. This was the first vol. of that writer's work, since it seems to be very generally accepted nowadays that St. Luke supplemented his first writings by the addition of the Acts of the Apostles. These three gospels form what are called the Synoptic gospels, the fourth gospel, that according to St. John, being held to stand upon a somewhat different plane. The gospel according to St. John was written probably about the end of the first century. It

contains much the same information as the Synoptic gospels, and was probably written with full knowledge of what those gospels contained. But it is written from a highly ethical and idealistic point of view, and formulated the doctrines of the Christian creed in such a way as to reconcile them and make them more acceptable to the Gentiles. The fourth gospel has played the most important part in the history of Christian theology, and in the formation of the Christian creed. The Acts of the Apostles, as mentioned above, form the second contribution of the writer Luke, and seem, from internal evidence, to have been written in part at least by an eyewitness. It traces the history of the Christian Church from the death of Christ down to the coming of Paul to Rome, where they leave off very abruptly, leaving the later history of the 'apostle to the Gentiles' in obscurity. The writings included in the N.T. form by no means the end of the writings of the early Christian Church. We have a number of writings of the followers of the apostles, who followed the traditional writings, and who wrote many books. Amongst these may be mentioned the gospel according to the Hebrews, the Ebionite gospel, the Protevangelium of James, and the Acts of Paul. The canon of the N.T. was much disputed. The various churches adopted varying canons for the literature of the N.T., but early in the 4th century Eusebius gives us an account of the disputes, and reviews the books which were generally accepted. He gives three classes, the first of which was generally accepted, and included the Gospels, the Acts, the Pauline Epistles, 1 Peter, and 1 John, together with the Apocalypse. The other epistles, Jude, James, Peter, and 2 and 3 John, are questioned. Books such as the Acts of Paul and Hermas are rejected. But the church of Antioch and the church of Syria give other lists. Under the influence of Athanasius, however, and at the Council of Carthage, the canon of the N.T. was fixed as we have it at the present day. Disputes, however, still rose with the Eastern Church, but in the course of time the canon as fixed by Athanasius and Jerome was generally adopted by the Church universal.

Bible, English.—The history of the Eng. B. consists in the early shapes of its development merely in translations in manuscript in the English tongue directly from the Vulgate. Bede tells us that Cædmon instructed by an angel put into poetical form 'The Creation of the World and the beginning of the Human Race,' whilst Bede himself, although none of the work is now extant, is said on reliable authority to have trans. part of the gospel according to Saint John into the English tongue. During the centuries which passed between the death of Bede and the Norman Conquest we have many translations of various parts of the B. which take in many cases the form of glosses. No very great attempt seems to be made at independent translations, and yet in some cases we have examples of these translations, but for the most part the work takes the form of glosses. With the coming of the Normans it is only natural that this translation should cease, a conquered race treated in a servile manner by their conquering masters cannot be expected to put forth the necessary energy or spirit to produce translations in the vernacular, a tongue which was only spoken in their hovels and which was entirely disregarded by their conquerors in the court and the high places of the land. But with the ultimate separation from the Continent, and the union of the Saxon and Norman people into the one Eng. race, by a very natural law the preponderating section of the community imposed their language and their customs on the conquering race. Although during the period of absolute Norman influence we have some evidence of translations of parts of the B., all such translations are into the language of the conquerors, but now we come to the *recommencement of English versions.* Previous to the great version by Wycliffe we have some evidence of parts of the B. having been trans. into English during the 14th century. In the 14th century we get the Wycliffite versions of the B. The early version was issued probably about 1382, and the later version four years after the death of Wycliffe, that is in the year 1388. What part Wycliffe himself actually took in the translation is not definitely known, it is, however, supposed on fair evidence that he trans. the gospels. The work began by the translation of the gospels, and this part was probably finished some twenty years before the B. was actually pub. The vast probability is that the O.T. portion of the early version was the work of a very fervent Wycliffite, Medas de Herford. The later version was probably the work of the successor of Wycliffe, John Purvey, and is certainly, as far as idiomatic English is concerned, a great improvement on the early version. It was also very popular, there being a great many copies of it remaining at the present day, in spite of the persecu-

tions of the Lollards. These versions were the last of the MSS. Bs. of England. In the 15th century John Caxton had introduced the art of printing into this country, and ultimately advantage was taken of it to print at least portions of the Scriptures. It is, however, necessary to notice that the printing of an Eng. B. did not immediately follow the introduction of the art of printing into the country; that the B. had been printed in the German states at least seventy years before an Eng. printed version appeared; and that no complete Eng. B. was printed in England before 1538. A printed ed. of the N.T. by Tyndale appeared in 1525, having been translated into the vernacular, and printed under difficulties somewhat great. During the ten years which followed, Tyndale also trans. and printed various other portions of the B. The characteristic point of the translations of Tyndale are their absolute independence of the work of any other translator. The first full translation of the Eng. B. is the work of Miles Coverdale, which, although it must have been in progress at the same time as the work of Tyndale, was done independently of this. His translation is not so independent as that of Tyndale. Coverdale probably used in his translation Luther's B., the Vulgate, and, from some evidence, Tyndale. The first Eng. B. printed in England was the work of one Thomas Matthew, who cannot claim to be at all an independent writer, since the greater part of his work is a reproduction of Tyndale and Coverdale. Dr. Westcott points out that this B. was printed by the king's licence, and that from this ed. of the B. we get all our subsequent eds., this being taken as the standard work. The next edition of the Eng. B. was the 'Great B.' undertaken under the patronage of Thomas Cromwell, and giving on its title page a picture of Henry VIII. presenting the B. to Cranmer and Cromwell, who in turn presented it to the clergy and laity. This B. was printed under the supervision of Coverdale, and while the printing of it was commenced in Paris it was finished in London, owing to the action of the Inquisitor-General, who attempted to stop the printing in Paris. In 1560 appeared the Genevan, or the 'Breeches' B., so called from the translation of Genesis iii. 7, 'They sewed fig leaves together and made themselves breeches.' The printing and publication of this B. was done at the expense of the congregation at Geneva. The B. was a thorough revision of the 'Great B.' The Bishop's B. was printed about the year 1568, and was undertaken as an A.V. of the Great B. But although it was intended to drive out the Genevan B. it never succeeded in its object. At the end of the 16th century and the beginning of the 17th century respectively appeared a N.T. and an O.T. trans. into English by Catholics. The N.T. was printed at Rheims, and the O.T. at Douai in 1582 and 1609 respectively. They had a fair amount of influence on the A.V. of the B. which appeared in 1611. The work of bringing out the A.V. of the B. was one of the results of the Hampton Court Conference, called by James I. in 1604. He suggested the revision of the Eng. B., a work to be done by the best scholars in the kingdom. The version was to be without notes, since the notes of the Genevan B. seemed to the king to be seditious and dangerous. The men who were employed to do this work consisted of the best scholars in the country. They were divided up into six committees, each committee having a special section of the B. to work upon. The whole of their work was revised by a general committee. That the work was carefully revised is obvious from the fact that over two years were spent in that revision, and altogether the work took about seven years. This version continued to be used, and still, in spite of a R.V., continues in general use in this country at the present time. The R.V. was the work of Convocation, it being determined in Convocation in 1870 that two committees should be formed for the revision of the Scriptures of the O.T. and N.T. respectively. These committees were to have the power to invite the co-operation of any eminent scholar, no account being taken of nationality or creed. Co-operation was invited with America, and the work ultimately became the work of English-speaking Christians throughout the world. The Roman Catholic Church alone refused co-operation. The version was completed by 1881, and was in that year presented to Convocation. Since that time it has been used in churches throughout the length and breadth of the land, and is slowly replacing the older A.V., having many advantages of translation and rendering over that version.

The texts and versions of the B.— The earliest of all extant Heb. MSS. of the O.T. only dates back to the 9th century A.D. That is sev. centuries later than the earliest texts which we have of the Scriptures of the N.T. All the Heb. MSS. which we have at the present time are essentially Massoretic texts. The Massoretic texts are the work of a sect known as Massoretes, who, continuing in a way

the work already done by the Targums and the Talmudists, set themselves the task of sifting from the mass of tradition and commentary of the Talmudists, and from the paraphrases of the Targums, the real, actual text of the O.T. Their work continued from about the 6th to the 11th centuries. They provided the text with points to indicate the vowels, and thus went far in fixing the correct interpretation of doubtful passages. In this work they were making a distinct advance on the work of the Talmudists, who had said much concerning the correct vowel pronunciation of the Hebrews, but had not actually provided vowel points for the MSS. After the production of an actual text from the mass of tradition of the Talmudists, extraordinary precautions were adopted for the safe preservation of the corrected MSS. Another text is that of the Samaritan Pentateuch, which differs in many places from the Massoretic text, the differences being usually of small importance, but the Massoretic text is preferred to this. This text contains only the Pentateuch, and is therefore not of very great importance. One of the most important versions which we have is that of the Septuagint, which is a copy of the books of the O.T. written in Greek, and probably made in Egypt during the 3rd century B.C. The Septuagint version, however, when completed contained not only the books of the Heb. canon, but the books which have formed the books of the Apocrypha since the Reformation period. Of Syriac versions the most important is the Peshitto Syriac or the Simple Version, made probably about the 3rd century A.D. This version became a necessity to the Christian missionaries who were spreading abroad the doctrines of Christianity in the lands of Syria and Mesopotamia. There are also Coptic and Ethiopic versions which were used for much the same purpose in Egypt and the neighbouring countries. Of Lat. versions the two most important are the old Lat. version, which is far more important from the point of view of the N.T. than of the O.T., since it is only a Lat. version of the Septuagint in the O.T., but an actual translation of the original Gk. in the N.T.; secondly, the Vulgate, B. of the Roman Church even at present day, the O.T. of which wa translation by Jerome of the old Heb. text, the text which we now call Massoretic not yet pa the Massor same from century.

Bible Christians, a society founded in 1815 by William O'Bryan, or Bryant, who was a Methodist lay preacher. The name B. C. was given to the sect because they appealed only to the Bible for the doctrines which they taught. The society was founded at Shebbear, in N. Devon, and became of importance in Devonshire and Cornwall. The ministrations of the Wesleys undoubtedly had great influence on the development of this sect, but the district in which it became first of great importance was one which had to come under the personal influence of the great leader of the evangelical revival of the 18th century. The sect flourished, but increased in numbers slowly. O'Bryan was the natural leader for some time, but when he put forward extravagant claims, the sect split into two divisions. A reconciliation took place, and agents of the B. C. were sent to various parts of the British Empire. They did not differ essentially from the Methodists in any point, but yet in the early days they suffered much even at the hands of the Methodists. They amalgamated with the Methodists in 1906, and now form part of the United Methodists. Outstanding names in their denomination are those of O'Bryan, Thorne, and Billy Bray. In 1906 they had over 200 ministers, 30,000 members, and 650 chapels.

Bible Communists, founded in 1848 by J. H. Noyes, and known as the Oneida Community. The primary object of the community was essentially religious. It certainly flourished at the beginning, and many of its practices were hyper-communistic. They practised not only community of property and life, but by means of a system called complex marriages, community of women also. In 1879 this system of complex marriage was discontinued, and two years later the movement was turned into a joint stock company. It has but with marriage et feature was banished.

Bible Societies. These may be defined generally as associations which have as their chief work the translation and propagation of the Scriptures amongst all nations. They are usually accepted as a late outcome of the nd indeed it is only after the Reformaieties begin to attain any real importance; but previous to the Reformation, and during the period immediately following the Reformation, we find the Scriptures being translated and to a certain extent dissemin That the doctrine that

of the Protestants had a great influence on this movement cannot for one moment be denied. Before or during the 18th century we find the following societies formed: The Society for the Propagation of the Gospel in Wales, 1662; the Society for Promoting Christian Knowledge, 1698; the Danish Society for Sending Missionaries to India, 1705; the Society for the Propagation of the Gospel in Foreign Parts, 1701; the Society for Promoting Christian Knowledge Amongst the Poor, 1750; the Naval and Military Bible Society, 1780. All these societies had ultimately the same object in view—the spreading of Christia[illegible] lation and In Germa[illegible] been formed with the same object, and the society formed in 1792 for the Propagation of the Gospel in France was brought to a speedy end by the Revolution. The evangelical revival of the 18th century naturally had a great influence on these societies, and led to the establishment of many new ones.

The British and Foreign Bible Society.—This society was founded in 1804, and remains to the present day the most important of all B. S. It had its origin in the difficulty which the Rev. Thomas Charles of Bala found in the work of propagating the gospel in Wales, owing to the lack of Welsh Bibles. To eradicate this difficulty the society was formed with the object of sending out copies of the Gospels translated into the necessary languages to those countries where the need for them was felt. They were to be neutral as far as doctrinal translations were concerned, and were to help in the circulation of the Holy Scriptures 'without note or comment.' The original society founded in London in the year already mentioned consisted of a committee of thirty-six, six of whom were to be distinguished foreigners who lived in or near London, and the remaining thirty members were to be divided amongst representatives of the Church of England who had a membership of fifteen, and representatives of nonconformity who had a similar number of members. The society found support from all Christian bodies, and developed rapidly, having at the present day 6000 auxiliary societies in England and Wales, and over 2000 abroad. The contributions from all sources amount to nearly £500,000. Nearly 2,000,000 copies of Bibles and Testaments are distributed every year, the majority of which are distributed in England and Wales, whilst the society also sends large contributions annually to the various religious associations throughout the country. The society met with many difficulties, especially from its adhesion to the principle of the distribution of the Scriptures without note or comment, but it has in most cases been able to surmount its difficulties. Other British Bible Societies which may be noticed briefly here are the Edinburgh Bible Society, 1809; the Glasgow Bible Society, 1812, which, owing to difficulties as to the form in which the Scriptures should be published by the British and Foreign Bible Society, disassociated themselves from that body, and became in 1861 the Scottish National Bible Society. The Dublin Bible Society was founded in 1806, and afterwards, by amalgamation with kindred societies throughout Ireland, became the Hibernian Bible Society. It is associated with the British and Foreign Bible Society, and contributes annually to the funds of that society. Amongst the more important of the European B. S. may be mentioned the Prussian Bible Society, 1814, originally started as the Berlin Bible Society in 1806; the Russian Bible Society (Revel), 1807; the Swedish Bible Society, 1814; and the Finnish Bible Society, 1813; ther eare in addition innumerable others. Most of these societies found considerable support in the early days from the British and Foreign Bible Society, and many of the Continental societies have been bitterly attacked by the Roman Catholics. There are no Roman Catholic Bible societies; the Catholic *Encyclopædia* saying on the subject, 'The Church, believing herself to be the divinely appointed custodian and interpreter of Holy writ, she cannot, without turning traitor to herself, approve the distribution of Scripture "without note or comment."' In America the Philadelphia Bible Society was founded in 1808, and gradually a number of societies grew up which by 1839 had all amalgamated into the American Bible Society. The American society is one of the most active of all Bible societies, distributing well over 2,000,000 copies of the Scriptures every year, and translating these into nearly 100 different languages. The society is wealthy, and since its inception has distributed nearly 100,000,000 copies of the Old and New Testaments.

Biblia Pauperum, a Lat. term meaning 'Poor Men's Bible,' is the name which has been given in modern times to a series of MSS. and printed books which contain rude illustrations of biblical subjects, with a short explanatory text accompanying each picture. Very often these pictures represented events in the life of Christ, together with the

corresponding prefigurements or types that occur in the O.T.; the text was in rhyming Latin verse. On an antipendium or altar-front in the Leopold Chapel of Klosternenburg in Austria fifteen scenes from the life of Christ were executed in enamels. Each scene was accompanied by two O.T. prefigurements, and the date of the work was 1181. The MS. at St. Florian, in Austria, dating from the early 14th century, is the first one known to contain a similar triple arrangement. The books which contain such pictures belong to the class of 'block-books' which were produced largely during the years preceding the invention of typography. They are so called because they were printed from engraved wooden blocks; it is not certainly known whether the books were printed by rubbing the back of the paper, when placed on the block, or whether a primitive type of press was used. One side only of the paper was printed on, and two blank sides were then pasted together. The name B. P. is first used in Heinecken's *Idée Générale d'une Collection d'Estampes*, 1771.

Bibliography is derived from the post-classical Greek word *βιβλιογραφία* which, when first used, meant the 'writing of books,' and was so used in France ('bibliographie') till the 18th century, and in England till the 19th century. It was mainly owing to the Rev. T. F. Dibdin that the change was then made in England; Southey preferred the term 'bibliology,' which has now dropped into desuetude. The early Fr. [illegible] gerated [illegible] nd scope of it came within their province to classify books from the point of view of their value as literature, their artistic excellence, etc. It is now recognised that the proper function of B. is to suggest certain general principles of arrangement and their application. These principles are not very many in number nor particularly abstruse, and the main requisite of any B. is that a really definite idea should exist as to the use of the finished work. At the present time one school of bibliographers has for its special study such subjects connected with books as the history of printing, book-collecting, book-binding, book-illustration, and other allied topics. The London Bibliographical Society, the Edinburgh Bibliographical Society, the Grolier Club of New York, and other such institutions, are concerned with such subjects. There are no good general treatises on them, but, in addition to the publications of the societies mentioned above, several periodicals have, at one time or another, been pub. to cater for persons interested. These periodicals, among which may be mentioned *The Bookworm*, 1888-94; *Bibliographica*, 1895-7; *Le Livre*, 1880-89; and *Zeitschrift für Bücherfreunde*, 1897, have not as a rule been long-lived. Information may also be found in *The Library*, 1893, by Andrew Lang; *The Printed Book*, trans. from the Fr. of Henri Bouchot by E. C. Bigmore in 1890; *Connaissances Nécessaires à un Bibliophile*, 1899, 5th ed., by E. Rouveyre; Graesse's *Trésor de Livres Rares et Precieux*, 1850-69, and kindred works. Such things as the histories of printing, book-binding, etc., do not properly come within the prov. of B.; further information will be found in the sev. articles on the subjects already mentioned as included by the bibliographers of this school.

The usual definition of the science of B. is the science of books as such. It thus comprehends the subject and class of the work, the size, the pagination, the type, the plates, the rarity, etc. It will thus be seen that the ideal of bibliographical work is the provision in an accessible form of a comprehensive description of a copy of any book, possessing any typographical, historical, or literary interest, in its original form as first pub., and of any different issues of it. When such a catalogue has been compiled and verified, each individual work could be described by a simple reference. Such an ideal is, of course, impossible at the present time, owing to the enormous quantity of books already printed and being printed every year, and consequently bibliographers are obliged to restrict the scope of their catalogues to the special object for which they are required. Thus catalogues are found of the books of a certain author, or of those pub. in a certain period, or of those dealing with special subjects, etc. The standard description of any book generally consists of the following sections: (*a*) A transcript of the title-page, the colophon (if any), and any [illegible] headings. (*b*) [illegible] number of leav[illegible] asurements of such leaves, and the different kinds of type employed, etc. (*c*) A description of the literary contents of the book, and the extent thereof, etc. If any other point not included in the above requires to be mentioned, as imparting some distinctive or necessary information about the particular work, it is put at the end of the above descriptions.

When a bibliographer wishes to describe a book, he examines it first of all to discover its origin, and to test the statements as to the publisher,

etc., and to see if it is in perfect condition. He also notices if the type corresponds to the alleged date of the work, and whether any leaves have been inserted from another copy in order to supply omissions. This can be discovered by observing whether the 'signatures' of the folios correspond as they should do. The 'size' of a book is the relation of the size of the separate pages to the original sheet of paper of which they formed a part. Thus when the sheet is simply folded in two the book is in 'folio,' when in four it is in 'quarto,' when in eight 'octavo,' or 8vo, etc.

The names of Bs. dealing with the special subjects already indicated will be found in the articles on those subjects, but among the best known general catalogues, etc., the following may be mentioned: *General Catalogue of the Library of the British Museum;* Watt's *Bibliotheca Britannica,* 1824; Heinsius' *Allgemeines Bücher-Lexikon;* Kayser's *Index Locupletissimus Librorum;* Quérard's *La France Littéraire,* etc., etc.

Bibliomancy (Gk. *βιβλίον,* a book, and *μαντεία,* prophecy) is a means of obtaining omens as to the future, which is widely practised. The method of procedure is as follows: the person wishing to obtain information opens the book at random, and then endeavours to apply the passage displayed to the particular case. The book usually chosen now for the purpose is the Bible; the ancients used Homer or Virgil, the process being then termed *sortes Homericæ* or *sortes Virgilianæ.*

Bibliomania is a Gk. word used to describe the capricious folly of the book miser, which impels him to acquire books, destitute of literary merit, the rarity of which is their one claim to distinction. The passion is an old one, but the actual word was introduced from the Fr. about 1750, when even among educated people there was a strong desire to possess uncut copies of vellum and first eds. of quite obscure works. From the time of Brandt, however, satire has been freely poured on this fashionable madness, and the kindly ridicule of Abbé Rive, Dr. Ferrier, and others has done much to correct the taste of the bibliophile. The word is also applied to an acute attack of a longing to possess certain books, such as induced the Marquis of Blandford to pay £2260 for the Valdarfer Boccaccio (1471), at the Roxburghe sale in 1812. To quote two other examples of purely fanciful book prices, Caxton's *Eneydos* fetched £2350, and at the Ashburton sale in 1897 an original Gulenberg and Fust' Bible (1450) was knocked down to the bidder at £4000.

Bibliothèque Nationale, the French national library in Paris. There is mention of a collection of manuscripts by Charlemagne, but Charles V.'s is the most famous of the early collections. The library has had many homes, as, for example, at Fontainebleau under Francis I. and later in Mazarin's palace. It was finally, however, installed in its present buildings (Rue Colbert), erected between 1854-75. There are five depts.: printed books (3,500,000), manuscripts (100,000), prints, maps, and coins, each with a room open to the public.

Bibra, Baron Ernst von (1806-78), Ger. writer, travelled in Brazil, Chili, and Peru, and brought home good natural history and ethnological collections. Not only did he pub. his explorations in *Reisen in Südamerika,* 1854, but wrote also many works on chemistry and some novels remarkable for their excellence of description.

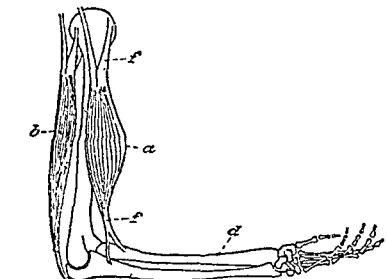
Bibulus, Marcus Calpurnius, was consul with Julius Cæsar in 59 B.C. His efforts to oppose Cæsar's agrarian law and other democratic measures being futile, he excited much ridicule by spending eight months of his consulate shut up in his own house. As proconsul of Syria he further displayed his incapacity. He died about 32 B.C.

Bicarbonate, an old name for acid carbonate. The gas carbon dioxide (CO_2) when dissolved in water is looked upon as carbonic acid, which may be represented as H_2CO_3. If both hydrogen atoms are replaced by a metal the resulting compound is called a carbonate, as sodium carbonate, Na_2CO_3; but when one hydrogen atom only is replaced, the result is a bicarbonate, as sodium bicarbonate, $NaHCO_3$, the name being due to the fact that the proportion of the carbonic acid group to the amount of sodium is doubled. The term bicarbonate usually refers to bicarbonate of soda, which is useful medicinally as a gastric sedative and antacid. *See* SODIUM and SODA.

Bice is the name of two pigments, of blue and green respectively. In the natural B., formed with clay mixed with yellow ochre, the blue and green colours are due to the carbonate of copper in the B. The artificially-manuf. B. is not so durable as the natural. B. has long been known to artists under various names, but its use is now dying out. The etymological origin of the name is obscure.

Biceps (Lat., from *bi,* two, *caput,* head) is an anatomical term meaning two-headed. It is used to denote two muscles of the human body, one of the arm, the other of the leg. The former, the 'B. flexor cubiti,' is the

muscle on the upper arm, which serves to flex the elbow; the 'B. flexor crucis' extends along the whole of the back of the thigh and flexes the knee. In popular use 'biceps' generally denotes the muscle of the arm.



a, biceps; *b*, triceps; *c*, ulna; *d*, radius; *e*, tendons.

Bicester, a mrkt. tn. of Oxfordshire and the seat of the county courthouse, is situated 11 m. N.N.E. of Oxford. The ruins of Alia Castra (Alcester), probably one of the fortified places built by Plautius, lie a mile and a half to the S.W. of B., on the Akeman Street of the Romans. There are sev. fairs held annually in the tn., at Easter, in June, in August, at Michaelmas, and in December: there are manufs. of rope, clothing, and pale ale. Pop. 3500.

Bicêtre is the name of a noted hospital of Paris, situated on an eminence on the S. side of the city. Founded by Louis IX. as a Carthusian monastery, it was in the possession of John, Bishop of Winchester, in 1290, hence the name of B., a corruption of Winchester. Destroyed in 1632, it was rebuilt, and is now, after having been a hospital and a prison, a home for indigent old men and incurable lunatics.

Bichat, Marie François Xavier (1771-1802), French anatomist and physiologist. In 1797, he was appointed lecturer in anatomy, surgery, and experimental physiology at the Hôtel Dieu, and in 1800 he was made physician. He is regarded as the founder of general anatomy. His chief w[illegible]es, 1800; [illegible]rt, 1800; [illegible]a la Phy[illegible]1.

Bichromate Cell, a voltaic cell in which the electric current is associated with the chemical action of a mixture of potassium bichromate and dilute sulphuric acid upon zinc. The mixture is contained in a bottle-shaped vessel in which a zinc plate fixed to a brass rod is placed between two carbon plates. When the cell is not in use the brass rod should be raised and secured by a screw so that the zinc is clear of the exciting liquid. The electromotive force of the cell diminishes rapidly after a short time, so that it is not used in batteries where a current is needed for long periods.

Bickerdyke, John, the pseudonym of Charles Henry Cook (*b.* 1858), an Eng. journalist, novelist, and sporting writer, born in London. His works include: *Angling in Salt Water*, 1887; *Days in Thule with Rod, Gun, and Camera*, 1894; *Sea Fishing* (in the Badminton Library), 1895; *Wild Sports in Ireland*, 1897; *The Book of the All-round Angler*, 1900. He was part editor of *Pike and Perch*, 1900, and contributed to the *Ency. Brit.* and the *Victorian County Histories*.

Bickerstaff, Isaac, pseudonym adopted by Dean Swift, when in 1709 he published the pamphlet burlesqueing Partridge, the almanac-maker, whose death he solemnly foretold and proved.

Bickersteth, Edward (1786-1850), a clergyman of the Church of England, was born at Kirkby-Lonsdale, Westmoreland, on March 19. He was a solicitor at Norwich from 1812 to 1815, but his religious tendencies became more pronounced, and he took deacon's orders in 1815, and was admitted to full orders in the same year by the Bishop of Gloucester. He proceeded with his wife on a mission to Africa, and on his return in 1817 was made secretary of the Church Missionary Society, a post which he filled till 1830. He became rector of Long Watton, in Hertfordshire, in 1830, and spent the remainder of his life there. He died of congestion of the brain on Feb. 24. He pub. a large number of hymns, sermons, and tracts.

Bickersteth, Edward (1850-97), an Anglican missionary, grandson of above, was born at Banningham, in Norfolk. He went to Delhi in 1877 to be the first head of the Cambridge Mission there, which he founded. He returned to England in 1882, and was made rector of Framlingham, Suffolk, where he remained till 1886. In the latter year he went to Japan, and was made Bishop of Tokyo. He worked in Japan till 1896.

Bickerton, Sir Richard Hussey (1759-1832), admiral, during a long and distinguished career was stationed in many different quarters of the globe. He took part in 1781 in the action between Hood and De Grasse off Martinique. In 1799 he was made rear-admiral, and from 1801-5 was

with Nelson in the Mediterranean before Trafalgar. Soon afterwards he was recalled and given a post in the Admiralty, where he rendered valuable service. At different times he was associated with the Channel Fleet, but his highest office was that of commander-in-chief at Portsmouth.

Bicycle, *see* CYCLE.

Bida, the fortified cap. of Nupe in Northern Nigeria, W. Africa. The Niger flows 20 m. S. Elevation, 450 ft. Pop. almost 100,000.

Bidar, tn., Nizam's Dominions, India, 75 m. N.W. of Hyderabad. It is noted for manufs. of 'Bidri ware,' which are made in a metal composed of a mixture of tin, copper, lead, and zinc. Pop. 14,000.

Bidassoa is the name of a riv. which rises in the mts. round the valley of Bazton in Spanish Navarre, and flows into the Bay of Biscay at Fuenterrabia, after a course of 33 m. It forms the boundary between Spain and France, and was the scene of several battles in the Peninsular War.

Biddeford, a city in York co., Maine, United States. Has large cotton manufs. It stands on the Saco, which supplies power for factories. Pop. 18,000.

Bidder, George Parker (1806-78), engineer, was carried round the country as a 'calculating phenomenon,' until some one, interested in his extraordinary powers, educated him at Camberwell School and Edinburgh University. He was the inventor of the swing bridge for railways, and the founder of the Electric Telegraph Company, which was the first of its kind. Victoria Docks was his greatest engineering achievement, but his claim to renown rests rather on his faculty for rapid, accurate, and elaborate calculation—a faculty which he was able to exercise fully during his many years' service on parliamentary committees. His was the rare gift of visualising figures.

Bidding-prayer (Old Eng. *biddan*, to pray) is the formula or exhortation to prayer, which is said in England in cathedrals, at university sermons, in the Inns of Court, and elsewhere on special occasions. Such formulæ are to be found in ancient Gk. liturgies, and in Gallican and pre-Reformation liturgies of England. The main characteristic of the B., of which the form may vary, is that it directly informs the congregation of the object for which they are to pray. It ends with the Lord's Prayer. The B. is commanded to be used before every sermon, lecture, or homily in the canons of the Church of England of 1603; save in the places above mentioned, a collect is now generally substituted. Forms of Bs. which have been used at various times, from the 11th to the 15th century, have been collected in the *Manuale*, 1874, a work in connection with the Surtees Society. For further information on the subject, *see* the *Bidding of Prayers before Sermons*, written by Wheatley in 1845, and the *Church of Our Fathers*, 1849-53, of D. Rock.

Biddle, John (1615-62), 'the father of English Unitarianism,' was born at Wotton-under-Edge, Gloucestershire. In 1647, he published his *Twelve Questions or Arguments*, against the deity of the Holy Spirit. He was imprisoned, but next year published his *Confession of Faith touching the Holy Trinity*, etc., and he followed this by a tract bringing the fathers of the Church to support him. In 1655 B. was banished to the Scilly Is., where he stayed for three years. After the Restoration, he was again brought to trial, and fined heavily. He was unable to pay, and so was sent to prison, where he died. *See* his Life by J. Toulmin, London, 1791.

Biddle, Nicholas (1786-1844), American financier, was president from 1823-36 of the United States Bank. He resigned his second presidency—this time of the United States Bank of Pennsylvania—in 1839, two years before it ceased payment. The unjust charge of fraud which was brought against him was not followed up. His literary talent led to his being chosen to compile a *History of Lewis and Clarke's Expedition to the Pacific Ocean*.

Bideford (' by the ford ') is a seaport of N. Devon, 8 m. S.W. of Barnstaple. It is situated on both sides of the Torridge, 3½ m. above its confluence with the estuary of the Taw, and an old bridge of twenty-four arches unites the two divs. of the tn. Vessels of 500 tons burden can come to the quay. B. had formerly a very extensive trade, and is known as the starting-place of Sir Richard Grenville's last voyage, whilst it also figures prominently in Kingsley's *Westward Ho!* Its manufs. are ropes, sails, earthenware, leather, etc. Pop. 9000.

Bidens is a large genus of Compositæ, of which two species, the burmarigolds, are common to Britain. It received its name from two bristles which frequently surmount the angles of the fruit and serve in its distribution. The British species, *B. bipartita* and *B. cornua*, grow in wet places, while *B. Beckii* is an American waterplant.

Bidloo, Godefroid (1649-1713), famous Dutch anatomist and surgeon, born at Amsterdam, died at Leyden. For some time he was professor of anatomy at the Hague, and later occupied

the same position at Leyden, where he also taught chemistry. He was physician to William III. of England. His chief work is the *Anatomia corporis humani*, an elaborate treatise on anatomy in Latin, published in folio at Amsterdam, 1685. It is adorned with 105 plates by G. de Lairesse. These plates were the cause of a great controversy with George Cowper, a London surgeon, who had stolen the plates and used them as his own.

Bidpai, or Pilpay, a legendary Indian philosopher, to whom a

from the Sanskrit, means 'master of knowledge'), lived under a king called Dabshelim, by whom he was imprisoned, because of his free condemnation of the royal tyranny. He was later released to discuss the affairs of the kingdom, and was then commanded to write down his advice in Sanskrit in fable form. The fables early became very popular, and the news of them having reached Persia, the King Khosrū Anushirvan (A.D. 531-579) sent Barzoi, his court physician, into India to make a collection of them, and to translate them into Pahlavi. The physician made this translation under the title *Kalilah and Dimnah* from the names of two jackals in the Sanskrit version. From the Pahlavi, a translation into old Syriac was made, and the same version was again made the basis of a more important translation about A.D. 750. Then Abdullah - ibn - al - Mokaffah turned it into Arabic, and it was from this version that the fables were translated into most of the European languages. The chief sources of the *Fables of Bidpai* are the *Pancatantra* and the *Hitopadesa*. The stories,

much in common. The fables were translated into Hebrew by the Rabbi Joel, and from this work was translated the *Directorium Humanæ Vitæ* of John of Capua, a converted Jew. This was translated into Italian, and from the Italian into English by Sir Thomas North, 1570. There have been about twenty English translations during the last century. *See* J. G. N. Keith-Falconer's *Kalilah and Dimnah*, Cambridge, 1895.

Biebrick, a Prussian tn. on the r. b. of the Rhine, 3 m. S. of Wiesbaden in the province of Hesse - Nassau. It was formerly the residence of the dukes of Nassau. It has manufs. of cement, manure, sulphuric acid, and stucco. Pop. 20,000.

Biel, the Ger. name of Bienne, is a Swiss tn. in the canton of Bern, 20 m. N.W. of that city. Overlooked by the Jura, and situated on the Lake of Bienne, it is most pleasantly situated. Gardens and villas encircle the town, which is composed of an old quarter and a modern quarter, the one semi-mediæval in its irregularity, the other very modern in its regular elegance. From 1262 to 1352, B. belonged to the bishops of Basel; in 1352 it was allied to Bern, and was a free and independent city until 1798, when France obtained it, but in 1815 it was again united to Bern. Its industries are watch-making, cotton-spinning, cigar-making, tanning, and dyeing. Pop. 26,000.

Biela, Wilhelm, Baron von (1782-1856), Ger. astronomer, devoted his life to the fine arts and to astronomy. He is famous because of his discovery of a comet, which bears his name. This comet, after appearing in 1772 and 1805, was seen by B. at Johannisburg in 1826, ten days before Gambart saw it at Marseilles. Its return in 1832 caused [illegible] alarm, as it was believed it

Bielaya, a ri[illegible] m. long, rising [illegible] gov. of Orenburg, joins the Kama.

Bielefeld, a walled town in the Prussian prov. of Westphalia, 27 m. S.W. of Minden. It is picturesquely situated on the small riv. Lutter at the foot of the Teutoburger Forest. The anct. walls, which withstood their last siege in 1673, have been converted into broad promenades. The old castle of Sparenburg is the most notable building. There are a large number of Protestant deacons and deaconesses in the town engaged in philanthropic work, whilst the colony of Bethel is situated at a distance of 7 m. from the town. This began as a home for people subject to epileptic fits, but now includes houses for the training of deacons and deaconesses, and a workmen's home. The town is the centre of the linen industry of Westphalia, and the yearly output of linen is of considerable value. There are also large bleaching grounds, and the bleaching industry is very active. Other manufs include silk, velvet, sewing-machines, leather, damask, soap, and meerschaum pipes. The tn., which dates back as far as the beginning of the 11th century, has a pop. of 70,000.

Bieleff, or Bielev, a tn. of European Russia, in the gov. of Toula, situated on the R. Oka, 160 m. S.S.W. of Moscow. It is an old tn., and has fourteen churches and sev. convents

It became in 1468 the cap. of a vassal principality of Lithuania, but was captured by the Russians in 1494. It has a trade in grain. Pop. 10,000.

Bielena, a tn. of N.E. Bosnia, near R. Save, 75 m. N.E. of Sarajevo; pop. 10,000.

Bielgorod, or 'white town,' so called after a chalk hill in its neighbourhood, is a city in the gov. of Kursk, Russia, and 72½ m. S. of it. Situated on a sloping bank of the Northern Donets, it is quite picturesque. Though it has two cathedrals, the see is now transferred to Kursk. There are chalk quarries. Pop. 21,850.

Bieli Kliuch, tn. of Transcaucasia, Russia, on Abure plateau, by R. Khram, 22 m. S.W. of Tiflis. A noted summer resort. Pop. 20,000.

Bielitz, a tn. of Austrian Silesia, situated on the l. b. of the Biala, 18 m. N.E. of Teschen. It is connected by a bridge with Biala in Galicia. It has dyeworks and a trade in woollen goods, wine, and salt. Pop. 18,000.

Biella, a tn. in the Italian prov. of Novara, situated on the R. Cervo, 38 m. N.E. of Turin. It has been noted for the manuf. of woollen stuffs for many hundred years, and is the see of a bishop. Corn, rice, and hemp are also grown. The fields are irrigated by small canals, a system which prevails in this part of the country.

Bielo-ozero ('the white lake') is the name of a lake in the Russian gov. of Novgorod, situated in 60° 10′ N. lat., and 37° 30′ E. long. The lake has a length of 25 m. and a breadth of 20 m., its area being about 432 sq. m. Its waters flow into the Sheksha R., and thence to the Volga.

Bielopol, a Russian tn. in the gov. of Kharkov, on the Vira, 170 m. E. of Kiev by rail. Founded in 1672 there are brickworks, tanneries, and distilleries. Pop. 17,000.

Bielostok, or Bialystok, a tn. of Russia, on borders of Poland and Lithuania, 45 m. S.W. of Grodno. It is a growing industrial centre in woollens, cloths, silk, etc., with trade in grain and wood. A massacre of Jews occurred here in 1906. Pop. 80,000.

Bielschowitz, tn. of Silesia, Prussia, 29 m. N.E. of Ratibor. It has coal mines and zinc-smelting works. Pop. 7394.

Bielshöhle is the name of a cave situated in the Harz Mts., Germany, in the neighbourhood of Rübelaw. It is noted for its stalactites.

Bielsk, a tn. of European Russia, in the gov. of Grodno, situated 112 m. N.E. of Warsaw. It was the scene of a Polish victory over the Russians in 1831. Pop. 10,000.

Bielski, Martin (1495-1576), Polish chronicler. His *Kronika Polska* was the first book of chronicles written in the Polish language, and is the first important history of Poland. The work, which is still valued, was continued by his son.

Bieltzi, a tn. situated in the Russian gov. of Bessarabia, on the direct line of railway from Czernowitz to Odessa, and about 80 m. from Kishinev. There are brickworks and soap factories, also a trade in cattle and horses. Pop. 19,000.

Bien-Hoa is a mountainous prov. of Cochin China. It possesses a very healthy, equable climate. The cap. is B., about 16 m. f
municating with
canal. There a:

Bienne. *see* BIEL.

Biennials are plants which require two seasons of growth to produce their flowers and fruit, and differ from annuals only in this fact. In the first year they produce only vegetative shoots, in the second, flowers, fruits, and seeds, after which they perish. Examples are hollyhocks, sweet-williams, and foxgloves.

Bierley, North, a township in the E. division of the W. Riding of Yorkshire. Its pop. is 15,620, and it has large coal and iron resources.

Bier's Congestion Treatment, a method of dealing with certain diseases by inducing an increased supply of blood in the part affected. Strictly speaking, the congestion treatment refers to the method consisting of the retention of venous blood, but Dr. Bier's name has also been associated with certain methods for increasing the supply of arterial blood. His general name for the latter treatment is the artificial production of Active Hyperæmia, as opposed to Passive Hyperæmia artificially produced, which includes all methods of hindering the departure of the venous blood from the part affected. Both treatments are based on the principle of assisting nature by increasing the supply of the blood, and consequently of those agencies whose function it is to resist and overcome the disease-producing elements in the particular part of the body affected. Dr. Bier points out that hyperæmia, or an increased supply of blood, is spontaneously produced whenever there is an increased demand for the functioning of any organ. Nature's method, however, is often too slow. Though it may appear that the purpose of the healing agencies is the ultimate well-being of the total organism, we are hardly justified in supposing that their activities will always have that desirable result. The disease-resisting corpuscles are as ruthless in their treatment of affected but unreplace-

able tissues as they are in the destruction of inimical germs. That is why wounds are stitched, abscesses lanced and drained—that the healing process may be shortened and the strain on the general health lessened by artificially procuring the best conditions for the work of the body's natural healing powers. In like manner Bier's treatment proposes to increase the hyperæmia which nature has already produced in dealing with a morbid condition of any part, the fundamental principle being that the curative properties possessed by certain elements in the blood should be present in the highest possible intensity compatible with the well-being of the organism as a whole. The principal method of producing active or arterial hyperæmia is the application of heat. The apparatus used by Dr. Bier and his assistants for this purpose consists of hot-air boxes adapted to enclose the different extremities, the openings being well-packed with fire-proof asbestos cotton. The source of heat is a Bunsen-burner or a spirit lamp which may be regulated. The burner is placed beneath a chimney which communicates with the hot-air box, in which a shelf is interposed between the direct hot current and the limb. A thermometer is fitted to the box so that the temperature may be continually under observation and moderated if necessity arises. It is important that the heat should never be uncomfortable to the patient, and unless sensibility is diminished by disease, the operator must consult the patient as to the degree of temperature maintained. The usual effect of the treatment is to produce a copious perspiration which must be appropriately dealt with when the application is discontinued. Slight burns sometimes occur, and there is also a possibility of the skin being discoloured by a network of brownish lines, probably due to decomposed red corpuscles; this, however, soon disappears. The treatment should only be adopted on the advice of a physician experienced in hot-air practice, as it entails considerable demand upon the general strength, and in women has produced irregularities and abnormalities in menstruation. For these reasons, Dr. Bier has developed a passive or venous hyperæmia treatment, where the object to be attained is the retention of blood in the affected part for a longer period than the normal. This is usually effected by the application of a bandage or a ligature of rubber tubing at a part which the experienced operator has found to be suitable. The constriction should not be so intense as to cause discomfort; indeed, the comfort of the patient is a reliable sign of the effectiveness of the treatment. The blood is, as it were, encouraged to linger in the affected part, so that its functions may be more effectively performed. The treatment is to be intermitted at times, and the place of constriction altered if possible. The use of cupping-glasses, in which the air is rarefied by heat, and of more elaborate suction apparatus, also produces hyperæmia; though it is likely that such hyperæmia is partly arterial and partly venous. The effects claimed for the treatment are that it acts as an anodyne, diminishing pain in the affected part, and that injurious bacteria are more readily destroyed than in normal circulation. In the use of suction apparatus, an undoubted advantage has been demonstrated in procuring mobility of stiffened joints, the interior of the suction chamber being so arranged that the pressure of the atmosphere may be brought to bear in a given direction with a gradation of intensity, under a delicate control impossible by any other means. For tuberculous joints passive hyperæmia only is used, as in active hyperæmia there is danger of tuberculous matter being carried to healthy parts of the body. Under the congestion treatment many cases of startling cure have been reported.

Bierstadt, Albert (1830-1902), a Ger. artist, was born at Solingen, near Dusseldorf, but at the age of two was taken to America by his parents. He returned later to Europe and studied at the Academy of Dusseldorf from 1853-57. He visited Switzerland and Italy, and returning to America took part in General Landers' expedition across the Rocky Mts. As a result of this trip his picture of 'Landers Peak' attracted some attention at the Paris Expositio
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colouring. They achieved much success in Europe, and in France especially. B. was decorated by several continental countries, and created a member of the St. Petersburg Academy.

Biesbosch, the name of a dist. of Holland on the borders of the provs. of N. Brabant and S. Holland. Originally dry land, it now consists of a huge marshy lake with numerous islands. Its present state is due to the bursting of the dykes on Nov. 18, 1421, when 180 sq. m. were submerged, seventy-two vils. lost, and 100,000 people drowned. Of these vils. over forty have been reclaimed. The B. is connected with the North Sea by means of the Haringvliet and Hollandsch Diep.

Biezhetzk, a tn. of Tver, Russia, 70 m. N.W. of Tver; pop. 9090.

Biga, vehicle drawn by two animals. The term is usually applied to a variety of Roman chariot, which was commonly used in processions and in races. It was two-wheeled and high in front. The back, at which the charioteer entered, was open.

Bigamy. In English law, by the Offences against the Person Act, 1866, sec. 57, 'Whosoever, being married, shall marry any other person, during the life of the former husband or wife, whether the second marriage shall have taken place in England or Ireland or elsewhere, shall be guilty of felony, and being convicted thereof, shall be liable to be kept in penal servitude for any term not exceeding seven years;' but no offence is committed: (1) If the second marriage is contracted by a person not a British subject outside England and Ireland; (2) If the former husband or wife has been continually absent for seven years, and not been known to be living by the person marrying a second time; (3) If the first marriage has been dissolved by a divorce or a decree of nullity; (4) If there was a *bona fide* belief based on reasonable grounds that the former husband or wife was dead. To support a charge of bigamy a valid first marriage must be proved; thus if a man marries a woman while his first wife is alive and after the first wife's death marries a third, the last marriage is not bigamous, for his second marriage was a nullity. In Scotland, by the statute of 1551, the offence is one of perjury: at common law B. is punishable as an offence with imprisonment.

Bigelow, Erastus Brigham (1814-79), American inventor, contrived, whilst still a boy, a loom for weaving suspender webbing and piping cord. His other inventions were a machine for making knotted counterpanes and a power-loom for the carpet weaver, which has considerably cheapened carpets.

Bigelow, Jacob (1787-1879), physician and botanist, graduated in 1806 at Harvard University, where he was afterwards professor in more than one capacity. For more than forty years he practised medicine in Boston, but his title to renown rests on his original research in botany, as well as on his introduction of single-word nomenclature in the *American Pharmacopœia*, 1820.

Bigelow, John, an American journalist and statesman, was born at Malden, New York, Nov. 25, 1817. After graduating at Union College in 1835 he practised as a lawyer in New York for some time, from 1839. He later took up journalistic work, and from 1849-61 he was managing editor and, with William Cullen Bryant, joint owner of the New York *Evening Post*. Amongst the offices which he filled in his political career were those of United States Consul at Paris from 1861-64, Minister to France in 1864-67, and Secretary of State for the State of New York from 1875-77. His literary works embrace books of travel, biography, history, and occasional political discussions. His best work is his edition of Franklin's *Autobiography and Complete Works*, to which he added notes based on personal knowledge: this ed. supplanted the ed. of Jared Sparks in accuracy and completeness. He also pub. a brief biography of his friend and associate, William Cullen Bryant, and was an intimate friend and the literary executor of S. J. Tilden.

Bigelow, Poultney (*b.* 1855), American author, *b.* in New York; educated at Yale and Columbia Law School; called to the bar in the Supreme Court, New York, 1882. During 1875-6 he had made a journey round the world, and he continued to travel largely, making a special study of tropical colonisation and becoming intimate with the German emperor. He lectured at sev. universities on modern history and colonial administration; was correspondent for the *Times* (London) during the Spanish-American War, 1898. His works include *The German Emperor and his Eastern Neighbours; White Man's Africa*, 1898; *Children of the Nations*, 1901, etc.

Big Game. The pursuit of the larger fauna has had a fascination for men in all ages; ancient cave-dwellers, Assyrian kings, and modern sportsmen have all taken pleasure in hunting, and in recording their adventures. But to-day, instead of finding the bear, elk, or aurochs close at hand, the European hunter must go far afield if he desire to pursue large game. Even in Africa things have greatly changed. When the Great Trek took place, and long after, there were vast regions in S. Africa where lions and buffaloes were numerous, but now only small game can be found; the larger animals hav retreated, and long journeys with horse and ox-waggon are needed to get into their [illegible] follow days of [illegible] trackers. All [illegible] hard work, and often privation; a Cape waggon and team may cost £200 or more, or can be hired at perhaps £30 per month; horses, *unsalted*, are fairly cheap, but if *salted*, are cheaper at three times the price. Drivers and horse-boys must be hired, and provisions and medicine taken in good

quantity. In East and Central Africa native carriers are necessary, also native hunters, and in swampy districts all the work must be done on foot, which involves great fatigue and almost a certainty of sickness. For Central and East Africa the best start will be by rail to Mafeking or beyond, or by sea to Beira, for the lower Zambesi, or to Mombasa for British East Africa. The animals to be found include the lion, elephant, hippopotamus, rhinoceros, giraffe, buffalo, eland, and many species of antelope. Lions are especially plentiful in British East Africa and the Congo State, as also elephants and rhinoceri. In 1907 Col. Patterson saw sixteen of the latter at one drinking-place. Herds of buffalo were once frequent in Cape Colony, but have been killed off or driven N.; they were greatly thinned also in 1890 by a kind of rinderpest. They are now to be found mostly among the swamps of the Zambesi and Limpopo, and hunting them is difficult and dangerous. A wounded buffalo will hide and try to surprise the hunter, and even a 'dead' one must be approached with caution. There are close times for shooting, varying in the different states, and licences run from £1 10s. for small game up to £25 or more for the larger animals. India has always been famous for its wild animals, but money, and above all, influence, are necessary for enjoying the best sport. Without these one might spend many months in a 'tiger country' and see nothing, but with them India affords splendid chances. There is an immense variety of game, tigers, panthers, leopards, a few lions, wild boar, rhinoceri, and buffalo, besides deer and gazelles from the lordly Sambhur downwards. The tigers are un-

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in many parts of India, but especially in the Terai jungles (along the foot of the Himalayas), and in the Sunderbunds. They are generally shot from elephants, but sometimes from trees, towards which they are driven by beaters. Lions are now only found in the W.; they are sometimes very large, quite equal to those of Africa. Panthers and leopards are numerous: the snow leopard of the Himalayas is one of the finest prizes a sportsman can secure. Rhinoceri are found in the Terai and the Sunderbunds, and the gaur, or Indian bison, in the Sátpurá and other mountain ranges. One of the most noted sports of India is 'pig-sticking,' *i.e.* hunting the wild boar on horseback with spears. This always takes place over rough country, and requires pluck, hard riding, and dexterity; a wild boar at bay is a dangerous opponent. The Indian buffalo, living in swampy districts overgrown with tall reeds, has to be hunted on elephants, but sometimes in the Central Provinces the reeds are set on fire, after which the buffalo may be pursued on foot. The quarry itself is somewhat dangerous, but malarial fever is more to be dreaded. Up in the Himalayas those who enjoy the toilsome delights of mountaineering may stalk the markhor, ibex, and wild goat; brown and Himalayan bears also, and snow leopards, are sometimes met with. At a great altitude (10,000 to 17,000 ft.), the bharal, or blue wild sheep, needs expert stalking, and furnishes excellent mutton. Pamir sheep are said to stand 4 ft. high, and weigh over 400 lbs., and the argalis, or *Ovis ammon* of Tibet (of which there is a specimen at South Kensington), is nearly as large as a donkey. Burma also affords plenty of sport, its fauna including the elephant, rhinoceros, tiger, and leopard, besides innumerable deer. Elephant shooting, however, is strictly prohibited both here and in India. Good shooting may be had in some parts of Europe, especially Russia, Scandinavia, and the Alps. In the former wolves and bears are plentiful, and their skins are much prized. Bears are sometimes tracked down, about Nov., to their winter hiding-places, and not infrequently the tracker, having located several, goes off to the city and sells his discovery to some sportsman. Then after a sledge journey of many days, the hunter, with his guide and probably a dog, has a long tramp over the snow to the place of hibernation. The animal is waked out of his sleep, comes out with a rush, and either bolts or charges his assailants. Further S., in the Caucasus, wild boars abound on the lower slopes, and bears and bison also are found. Higher up there are chamois, ibex, and other mountain game; but though sport is plenti-

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bear is hunted by men on *skis*, with hounds in leash. The bear has keen

scent, but poor vision, and keeps to windward if he can; when cornered, he is dangerous, and not least so when apparently dead. Bears in Norway are now rather scarce. In our own islands the only large wild animals left are the red deer of Scotland and Exmoor, and the Chillingham herd of white cattle, the last representatives of the ancient quarry of the men of the Stone Age. Bears and wolves lingered much longer in Scotland than in England; there is a record of a fierce bear being killed by one of the Gordons in the 11th century, and wolves are said to have been numerous and destructive down to the 16th century. In N. America the hunter may find abundant sport, though the great herds of bison have vanished from the prairies; they were mainly slaughtered by the Indians, who killed hundreds to no purpose. After they found they could sell their 'buffalo-robes' to white men, they slew at a still greater rate. The last big herd was destroyed in 1883. The black bear also is becoming scarce, having been killed for his fur, but in the Rockies grizzlies and other bears are still to be found. Many sportsmen declare hunting the grizzly to be one of the most dangerous sports in the world. He has keen scent and hearing, is quick, savage, and tremendously powerful, having been known to carry a wapiti carcase, 1000 lbs. in weight, a considerable distance. He is generally caught by baiting with the body of a deer or other animal; when this is found to have been mauled (perhaps buried), the hunter hides, and watches for the bear's return. Sometimes he is tracked with dogs, who distract his attention, and afford an opportunity for a shot. Canada is rich in game, moose and caribou being the largest; these are also found in some of the States. The moose is often taken by 'crust-hunting,' when the surface of the snow is sufficiently hard to bear a man on his snow-shoes, but gives way under the sharp hoofs of the heavy animal, who is thus quickly overtaken; the caribou having larger feet can more easily escape. Of late years Newfoundland has become noted as a shooting ground, but in Eastern Canada as a whole B. G. is becoming scarce. The 'bighorn,' very rare elsewhere, is now preserved in British Columbia and Kootenay; it is difficult to stalk, there being always a sentinel on some high peak, constantly on the watch. Musk-oxen are found in the N., and some bison, and the Alaskan bears are almost as large as the grizzly. Polar bears are said not to give much sport, but are immensely strong; Captain Markham found one eating the body of a white whale 15 ft. long, and weighing 3 to 4 tons, which he had dragged up on the ice. Walrus may be hunted either with a rifle or harpoon; and some men have found arctic sport fascinating, but it is perhaps harder and more trying than any other. There is good shooting in S. America, but the country is largely unexplored, and extremely difficult. The chief animals are the jaguar, puma, many kinds of smaller game, including wild pig, and on the plains there are herds of wild cattle.

Armament. — For weapons, the following are among the most used. For large animals, the ·450 Express and the ·577; for the very largest a double 8-bore rifle. For smaller game the ·400 Express, the ·250 Lee-Metford, and the ·303 Mannlicher are very effective; in N. America, a Winchester is perhaps better, as ammunition for it is obtainable everywhere. A couple of good hunting knives, one for killing and one for skinning, are also needed.

The bibliography of game shooting is immense. A few selections must here suffice, but a whole library may be consulted at Mr. Rowland Ward's, 166 Piccadilly. F. C. Selous, *A Hunter's Wanderings in South Africa;* H. A. Bryden, *Kloof and Karroo;* W. C. Harris, *Wild Sports of South Africa;* Capt. Melliss, *Lion Hunting in Somaliland;* Lt.-Col. Patterson, *In the Grip of the Nyika;* Stigand. *Big Game of East Africa;* Col. Kinloch, *Large Game Shooting in Thibet, etc.;* Sir E. Braddon, *Thirty Years of Shikar;* Capt. Baldwin, *Large Game of Bengal;* J. Inglis, *Sport on the Nepal Frontier;* Phillips-Wolley, *Sport in the Crimea and Caucasus;* J. Lloyd, *Scandinavian Adventures;* Theo. Roosevelt, *The Wilderness Hunter;* W. R. Kennedy, *Sport in Newfoundland;* Baillie-Grohman, *Camps in the Rockies;* J. Turner-Turner, *Three Years' Hunting and Trapping;* J. Lamont, *Yachting in the Arctic Seas;* F. Nansen *Farthest North.*

Biggar, a small tn. in the upper ward of Lanarkshire, 25 m. S.W. of Edinburgh. It consists mainly of one lengthy street, and has a cruciform church with a tower in the middle Pop. 1700.

Biggarsberg, a range of mts. in S. Africa. It is practically an easterly extension of the Drakensberg Mts., and it separates the northern part of Natal and the dist. of Newcastle from the rest of the colony.

Biggleswade, a market tn. in Bedfordshire on the r. b. of the Ivel. It has a large weekly corn-market, and there are many mrkt. gardens in the neighbourhood, which send their produce to London. It has manufs. of

agricultural implements and motor vehicles; pop. 6000.

Bigha, or Biga, a tn. in Asia Minor, situated on the Bolki, about 18 m. from its entrance into the Sea of Marmora.

Big Horn, a navigable river of the United States, rising in the Rocky Mts., near Fremont's Peak in the N.W. of Wyoming. It is the largest affluent of the Yellowstone R., and is called Wind R. in its upper course. It is joined by the Little Horn R. at Fort Custer, to which point it is navigable. It traverses a mountainous country in a north-easterly course for about 450 m.

Big Horn is the name of a co. in the N.W. part of Wyoming, drained by the Big Horn R. and its tributaries. On the E. are the Big Horn Mts., on the W. the Shoshone Mts. Stock-raising and agric. pursuits are carried on, and a system of irrigation is generally practised. The cap. is Basin. The dist. has an area of 12,226 sq. m.

Big Horn is the name of a settlement in Custer co., Mont., U.S.A., situated at the confluence of the Big Horn and Yellowstone rivs., 240 m. E. of Butte city.

Big Horn Mountains are a range of mts. lying principally in the northern part of Wyoming, on the E. of the Big Horn R. They are composed of ancient sedimentary rocks with a granitic nucleus. The range runs in a north-westerly and south-easterly direction for nearly 180 m., and has a number of summits over 9000 ft., covered by perpetual snow. The Sioux, the most belligerent of the American Indians, had their fastnesses in these regions for a long time. In this district, 15 m. to the S. of Fort Custer, occurred the famous massacre of Big Horn, in 1876, when 250 men under General Custer were annihilated.

Biglow Papers, the title of a very humorous philosophic poem by James Russell Lowell.

Bignonia, a genus of plants of the Bignoniaceæ, named by Tournefort after the Abbé Bignon, librarian to Louis XIV. All the species are splendid plants while in blossom, most of them are climbers, and they are natives of Am[illegible] climbs by mea[illegible] tendrils, *B.* sharply-clawed [illegible]

Bignoniaceæ, a natural order of dicotyledonous trees or shrubs, found chiefly in Brazil, but also in Africa and America. They are nearly all twining plants with hermaphrodite, zygomorphic flowers, five joined sepals, five joined petals, four didynamous stamens, two carpels superior and usually bilocular with numerous winged seeds. The most interesting genera are Bignonia, Tecoma, Catalpa, and Eccremocarpus.

Bigod, Sir Francis (1508-37), rebel, took a degree at Oxford. For a little he served Cardinal Wolsey, but was entangled in the Pilgrimage of Grace, undertaken as a protest against Henry VIII.'s church reforms. He was hanged at Tyburn because he was a leader in the ineffectual rising of Beverley. Some of his letters may be seen at the Public Record Office.

Bigorre was formerly a sub-div. of south-western France, in the prov. of Gascony. It now forms part of the dept. Hautes-Pyrénées. The cap. is Tarbes; other tns. are Vic de Bigorre, Luz, and Lourdes.

Big Rapids, a city and cap. of Mecosta city, Michigan. It is situated on the Muskegon R., 55 m. N. from the city of Grand Rapids. It has an important trade in lumber, and there are iron foundries, mills, and furniture factories. Pop. 5000.

Big Sandy River, a river of Tennessee which runs into the Tennessee R. in Henry co., at the point where the Louisville and Nashville Ry. crosses the Tennessee R. It has a length of about 100 m.

Big Sandy River, a river of Wyoming, which runs into the Green R., 22 m. N. of Bryan, after a course of about 100 m.

Big Trees, a post-office in Calaveras, California. It has an alt. of 4600 ft. Its famous grove of sequoia trees, over 300 ft. high, gives it its name.

Bihać, or Bihacz, a strong fort. tn. in Bosnia, situated on an island of the Unna, 65 m. W. of Banialuka. Its possession was often contested during the Turkish wars. Pop. 3400.

Bihar, *see* BEHAR.

Bihar is the name of a range of mts. on the borders of Hungary proper and Transylvania. The range, of which the highest peak is B., or Cucurbeta (6000 ft.), contains the sources of the head-streams of the Koros, and on the eastern side those of the Aranyos River.

Bihari, Alexander (1856-1906), a Hungarian painter, born at Grosswardein; educated at Vienna and Paris, under J. P. Laurens. His works deal mainly with national peasant life in the dists. of Hungary round Szolnok. His most famous pictures are 'Gypsies [illegible] before the [illegible] easure Trip on [illegible] at Supper on [illegible] Roumanian Funeral.'

Bihe, the na[illegible] and town in [illegible] situated about [illegible] It lies at an alt. of 5300 ft. above the level of the sea, and has a sufficiently

mild climate to allow of the cultivation of corn and other crops. The kingdom, of which Kanjombe is the capital, has a pop. of over 100,000.

Bija Ganita, *see* VIGA GANITA.

Bijanaghar, Bijnagur, or Bisnagur, is a deserted city in the Madras presidency of S. India, 36 m. N.W. of Tumbuddra. It was an extensive place, 8 m. in circumference, and contains remains of temples to Shiva, Krishna, and Rama, besides other fine buildings. It was founded in 1336, and was a flourishing city when it was sacked by the Mohammedans in 1564.

Bijapur, or Bejapoor, a city of British India, in the Bombay presidency, situated on a trib. of the Krishna, and 245 m. S.E. of Bombay. It was a flourishing city in the time of the Moguls, and now consists of two parts, the fort on the E. and the old city on the W. It is one of the most picturesque collection of ruins in India; all the remains of the former magnificent buildings are Mohammedan, save for one very early Hindu temple.

Bijawar, a native state of India in the agency of Bundelkhand. The tn. of B. is situated in 24° 37′ N. lat., and 79° 31′ E. long. The title of the chief, who is a Rajput of the Bundela clan, is Maharaja. The state came under British administration in 1901. Its area is 974 sq. m., and its pop. 135,000.

Bijayanagar, a deserted city of S. India, in Madras, founded in 1336, and sacked by Mohammedans in 1564.

Bijbharu, or Bijbahav, a tn. in the state of Kashmir, on the R. Jhelam, 25 m. S.E. of Srinagar.

Bijnaur, or Bijnor, a tn. and dist. in the N.W. Provs. of British India, in the Rohilkand div. The tn., which is 3 m. from the l. b. of the Ganges, has a trade in sugar, and an Eng. high school for boys; pop. 19,000. The area of the dist. is 1898 sq. m.

Bikanir, a native state of India, in the Rajputana agency. The Maharaja Ganga Singh, who succeeded to the throne in 1887 at the age of eight, has been intrusted with full powers. Coal has been found in the dist. The chief industries are camel-rearing and the carving of ivory and gold bracelets and ornaments. The area of the state is 2309 sq. m., and the pop., greatly reduced by the famine of 1899-1900, in 1901 was 584,000. The tn. of B. manufs. blankets and candy, and has a pop. of 60,000.

Bikolas, Demetrius, a Gk. poet, was born in 1835. He drew his inspiration chiefly from the Klephtic songs, and he used the Epirotic dialect. His poems are characterised by much grace of style and an extremely vivid imagination, which have caused them to be highly esteemed by the Greek nation. His works rank with those of John Vilaras, 1771-1823; Theodore Aphentoules and George Zalokostas, 1805-57. Of modern Greek poets, B. is considered one of the greatest.

Bikh, Vish, or Bish, an Indian word which means poison. It is specifically applied to the extract of 'Aconitum ferox,' which was applied to arrow-heads, etc. This plant grows in the Himalayas and Nepaul.

Bikrampur, an anct. tn. of Dacca, Bengal, India; formerly the seat of gov. of the Hindu kings of Bengal, and an educational centre.

Bilara, a tn. of India in Jodhpur, Rajputana, situated on the R. Luni.

Bilaspur, a dist. in Central Provinces, British India, with an area of 7798 sq. m. The cap. is B., about 250 m. N.E. from Nagpur by rail. The products are rice, wheat, cotton, etc.

Bilbao, a picturesque, well-built tn. the cap. of the Spanish prov. of Biscay, on the navigable R. Nervion. The tn. lies in a plain a few m. from the sea encircled by mts. Three bridges span the riv. at this point, and B. has sev. fine churches, two beautiful promenades, a theatre, a marine school, etc. It owes all its prosperity to the exceedingly large deposits of iron-ore in the vicinity, of which about 5,000,000 tons are annually exported, mainly to Great Britain. Coal and coke are the principal imports, as smelting is also carried on, and pig-iron exported in considerable quantities. Among the other industries are the manuf. of steel, tin-plate, chemicals, glass, and paper; shipbuilding is also carried on. The tn. has the largest dry dock in Spain, and in addition another dry dock and two graving docks. Pop. 90,000.

Bilberry, or *Vaccinium Myrtillus*, is a plant belonging to the Ericaceæ, which is found on moors and hilly woodland dists. It has deciduous leaves and edible blue berries. Other names for it are whortleberry or blaeberry (*q.v.*).

Bilbilis, the name of a tn. of anct. Spain, now called Calatayud. In anct. times it was celebrated for the manuf. of weapons, and had also baths, called Aquæ Bilbilianæ. In the time of the empire it had Augusta added to its name.

Bilboes, fetters formerly used for offenders on board ship. This word, and *bilbo*, a sword (both Shakespearian), were derived from Bilbao, or Bilboa, noted for its iron and steel.

Bilderdijk, Willem (1756–1831), a Dutch poet, was born at Amsterdam. An accident in his youth compelled him to give himself up to study, and

he acquired the habits of vast industry which he retained throughout life. He studied at Leyden, and after taking his Doctorate of Law degree at that university, he started practice at the Hague. When, in 1795, the French invaded Holland, he refused to submit to the new administration and quitted the country. After a visit to Germany, he took up his residence in London. Here he had a discreditable love affair with one of his pupils, Katharina Schweickhardt, whom he married in 1802, having divorced his first wife. This took place in Brunswick, where she had followed him, and four years later his friends persuaded him to return to Holland. Here he was well received by Louis Napoleon, who made him his librarian. On the abdication of Louis, B. fell into great poverty, in which he died. He was a voluminous writer, and his works are conspicuous for command of language. Of nearly a hundred works which he wrote, we may name: *Buitenleven*, 1803; *De ziekte der gelcerden*, 1807; *De ondergang der eerste wereld*, 1820.

Bile, a fluid secreted by the liver. Human B. is yellowish brown or green in colour, is of a viscous nature, has a sp. gr. of 1010 (water = 1000), a bitter taste, an alkaline reaction, and a sickly odour. The quantity secreted by the liver averages 500 to 600 grains per 24 hours, but may amount to as much as 2400 grains. B. consists mainly of B. salts and B. pigments, with small quantities of fats, cholesterin and lecithin. The most important B. salts are sodium glycocholate and sodium taurocholate. The pigments are biliverdin, which is green in colour, and bilirubin, which is reddish. The former is most abundant in herbivorous animals, the latter in flesh-eaters, and the colour of the B. is determined by the relative proportions of these pigments. Both are waste products of the used-up hæmoglobin in the blood, the iron from which is, however, retained for further use. B. is secreted from the blood by the liver; some of it is temporarily stored in the gall-bladder, while the remainder passes through the common B.-duct to the duodenum, the first part of the small intestine. B. in itself is not a digestive juice, but certain of its salts promote greater activity in the pancreatic juices, and aid in the absorption of fats and fatty acids. The production of B. is practically continuous, but is stimulated by the processes of digestion. If by any means it is prevented from entering the intestine, digestion may proceed without much disturbance to health. If, however, excess of B. in the liver leads to its being reabsorbed by the blood, the condition known as jaundice is produced; the tissues are coloured yellowish by the B. pigments, and there is general derangement of the system. A *bilious attack* is only indirectly connected with B.; catarrh is set up by the ingestion of unsuitable or too abundant food, and sickness, headache, and giddiness result, with vomiting of food and bilious matter. Purified ox-bile has been used as an aperient and antiseptic. The B. of oxen which have died of rinderpest has been injected in cattle in S. Africa for the prevention of that disease, and the B. of serpents is looked upon as a partial antidote to their poisons.

Bilejik, a tn. of Asia Minor in the vilayet of Brusa. It has a pop. of 5000, and is situated 100 m. to the S.E. of Constantinople.

Bilge, *see* SHIPBUILDING.

Bilgram, a tn. in the United Provinces, India. It is situated in the Oude prov., about 50 m. N.W. from Cawnpur. There are the ruins of a temple of Srinagar.

Bilharzia (*Distomum* or *Gynæco-*

all other trematodes are hermaphrodite, in B. the male carries the female in a gynæcophoric canal formed from two folds of skin on the ventral surface. Pairs so united are found in the abdominal vessels both in men and apes, and cause hæmaturia, inflammation, etc., by the deposition of ova in the vessels of the mucous membrane of the intestines, etc. They occur from Egypt southwards to the Cape. The embryos are ciliated, but their life-history is unknown, as is also the exact cause of infection by them.

Bilin, a tn. in Bohemia, Austria, 7 m. S.S.W. of Teplitz. It has two castles, one, that of Prince Lobkovicz, having a collection of arms and minerals. B. exports alkaline mineral waters, and sugar is manufactured. Pop. 8500.

Bilin is a riv. in Burma. Its course lies between the Salwin and the Sittaung, for more than 280 m. It enters the Gulf of Martaban.

Biliousness, a condition characterised by loss of appetite, headache, lassitude, coated tongue, and constipation. It is popularly supposed to be due to over-secretion of bile, but is more probably occasioned by catarrh or other disturbances of the gastric regions.

Bill, or Beak, in natural history, is the term applied to the horny, toothless jaws of birds. The foremost bones of the skull are elongated, and

covered with a horny sheath or rhampotheca; the same with the lower jaw, or mandible. No living birds have any teeth, but the earliest forms of birds, such as the archæopteryx, undoubtedly possessed some. The Tertiary Period appears to be the time when birds ceased to have teeth; traces can still be found in certain species. The bill is not usually sensitive, though in some aquatic birds, and in the woodpecker, it is much more sensitive than usual. The chief uses of the B. of a bird are for dividing food, for fighting, preening, nest-building, etc. It varies greatly in shape in different species of birds, its conformation being adapted to the nature of its food and habits. Among peculiar beaks may be noticed the raptorial beak of birds of prey, the fissi-rostral beak of swallows, etc., the tenui-rostral beak of sunbirds, etc., and so on.

Bill. In English criminal law the accusation is drawn up in writing in the form of a 'B. of indictment,' which is presented to the grand jury, who, after hearing the witnesses on behalf of the prosecution, either find a 'true B.,' *i.e.*, are satisfied there is a *prima facie* case, or find 'no true B.,' *i.e.*, ignore the case. The B. of indictment so endorsed is presented to the court.

Bill-broker. Properly a B. is one who deals with bills of exchange, receiving bills from merchants, foreign or other banks, etc., and disposing of them for the best terms, and receives a commission on the transaction. But now the B. usually buys bills outright and sells them to banks and other buyers. He is financed by the banks by loans at call and short notice. He acts as prin. and not agent, and the name of broker does not strictly apply to him.

Bill Chamber is a dept. of the Court of Session in Scotland, which deals with business of a summary nature, such as applications for interdict, etc. During the sitting of the Court of Session the B. C. is presided over by a single judge, called Lord Ordinary, who is the junior judge of the court. During the vacation the B. C. has many of the powers of the Court of Session, and is presided over then by the judges in rotation. It is so called because in olden times summonses and executions were generally begun by a writ, called a bill, but since 1813 such a process is not necessary.

Bill in Equity or Bill of Chancery, was formerly a statement in writing of a plaintiff's case, setting forth the grounds on which he claimed relief. It is now an obsolete form of pleading, and its place is taken by a writ and statement of claim.

Bill in Parliament, *see* PARLIAMENT.

Bill of Adventure, in maritime law, a writing signed by a shipmaster, merchant, or owner, declaring that merchandise shipped in his name are 'at the venture' of another, and his responsibility is limited to their safe delivery.

Bill of Costs, an itemised account setting forth in detail the work done and the charges therefor and expenses paid by a solicitor on behalf of his client. By statute a solicitor must deliver a signed B. of C. to his client, and wait a month before suing for it.

Bill of Exchange, a form of credit instrument of practically universal commercial use, and governed by laws and regulations which, with certain differences, are identical in all countries. In the United Kingdom, the law, founded on mercantile custom, a great number of judicial decisions, and separate statutes, was codified by the Bills of Exchange Act, 1882, which has been adopted by British colonies and agrees in the main with the law of the United States. The original form from which the B. of E. developed was a simple means by which money could be paid in a distant place without sending cash; thus A living at X owes money to C living at Y; D also living at Y owes a debt to A; therefore A sends to C an order to D to pay the money to C; or suppose A sells to D goods on credit, but his business requires ready money; if he can get D's acknowledgment, and his credit is good, he can raise money now on D's promise to pay cash later for a consideration from a third party: thus arises the discounting of bills; D is going to pay A in three months for goods shipped, £100; C will lend A the money now at 4 per cent.; he therefore will give £99 and collect £100 from D when the time expires. Various forms of such means of transacting commercial business were no doubt in use in very early times, but the B. of E., as we know it, as a negotiable instrument, was evolved, it is said, by the Florentine Jews in the 13th century, and was in use generally in commercial Europe by the 14th century. There are two classes of bills, 'inland' bills, covering transactions in one country only, and 'foreign' bills, which are drawn in one country and payable in another. Bills may also be classified as good 'trade bills' where the transaction is based on produce or goods sold and coming into the market; such bills are said to pay themselves, and form the best kind of security for advances made on them; other bills, which are drawn on securities or on credit, are called 'finance' bills; lastly, there are 'accommodation' bills, or 'kites,'

where no valuable consideration passes between the parties to the bill. By the Bills of Exchange Act, sec. 3, a B. of E. is defined as 'an unconditional order in writing, addressed by one person to another, signed by the person giving it, requiring the person to whom it is addressed to pay on demand or at a fixed or determinable future time a sum certain in money to, or to the order of, a specified person, or to bearer.' Thus a cheque (*q.v.*) is a B. of E. drawn on a bank payable on demand. (It may be noted here that bills payable on demand, *i.e.* cheques, must have a penny stamp on them: other bills must be stamped *ad valorem;* the rates can be found in any almanac, postal guide, etc.). An example of a simple inland B. of E. will elucidate the definition:

£100 LONDON, 1*st Nov.* 1912.

Three months after date pay to the order of Mr. S. Robinson the sum of one hundred pounds, for value received. SMITH & Co.

To Messrs. JONES & Co., Glasgow.

The last words, 'for value received,' are not legally necessary, as the law presumes that the bill was given for valuable consideration. Here Smith & Co. are the 'drawers.' Jones & Co. the 'drawees,' who on signing their name across the front of the bill become 'acceptors.' Robinson is the 'payee.' By accepting the bill Jones & Co. become the persons primarily liable on the bill. The acceptor may qualify the bill by attaching conditions, *e.g.* delivery of bills of lading, or making it payable at a certain place, such as his bank. When the bill falls due, that is, on Feb. 1, 1913, with three days' grace, it is presented to the 'acceptors' for payment; if it is not accepted or not met by at maturity the bill is 'dishc and the holder must give r once to the drawer and al persons who have indorsed from whom he can then cla ment. If the bill is a 'foreign' bill it must be 'protested' by a notary public on the day of dishonour. A bill dishonoured by non-acceptance, can be accepted by another 'for honour supra protest,' if for non-payment, can be paid 'supra protest;' the new acceptor and payee having rights against the party for whose honour he has accepted or paid. A B. of E. is a negotiable instrument, the property in which passes, like money, by mere delivery, if the bill is made order example given above, the bill is made payable to the order of S. Robinson; if he wishes to transfer the bill he writes his name on the back. An indorsement in blank makes the bill payable to bearer; a special indorsement makes it payable to a specially-named person's order, who to transfer the bill must again indorse it, and so on. A bill can, and often does, pass through a large number of hands before it is discharged by presentation to the acceptor and payment by him, and the greater part of the law relates to the rights and liabilities between the various parties through whom it has passed. The person to whom a negotiable instrument is transferred by indorsement or delivery can sue in his own name, and if he is a 'holder in due course,' takes the bill free from all defects of title. To be a 'holder in due course' he must have given value for the bill, the bill must not be overdue or known to be dishonoured, and he must take the bill honestly and without notice of a defect in title, such as fraud, etc. *See* M. D. Chalmers, *Bills of Exchange;* Byles, *Bills of Exchange.*

Bill of Exchequer, or Exchequer Bill, a form of security on which the British Gov. borrows money for the public service, under parliamentary authority. They were first issued in 1696. They used to be issued annually, and bore daily interest till 1861. They were current for five years, and renewable, and the rate of interest, fixed half-yearly, varied with the money market. They became extinct in 1897, and have been superseded by treasury bills, which are issued for a maximum period of twelve months, and exchequer bonds, issued for a specific period, and with a fixed rate of interest.

Bill of Health, a document given to the master of a ship when clearing from a port, by the consul or other port authority; it shows the sanitary [illegible] of the port; ctious or con-; it is a 'clean ght possible or 'or 'touched;' is a 'foul bill.' Bs. of H. are necessary when the next port of call is one where the ship may be quarantined if there be no 'clean bill.'

Bill of Lading, a document signed by the master of a ship or an agent of the owner, acknowledging that goods have been received on board, and stating the terms on which they are to be carried. The B. of L. serves as a receipt for the goods shipped on board, as the memorandum of a contract between the owner of the ship and the shipper of the goods, and as a document of title to the goods, and if, as is usual, the goods are deliverable to the consignee's 'order or assigns,' the B. of L. becomes a negotiable instrument, transferring by indorse-

ment the rights to the goods and the various liabilities and rights of the contract. There are various forms of Bs. of L., but they all contain the names of the shipper, of the ship, the port where the goods are loaded and the destination, the description of the goods, place of delivery, name of consignees, freight, the excepted perils, and shipowner's lien. With regard to the more important of these items, it should be noted that it is implied that there should be no deviation from the route of the voyage, and the shipowner is liable for loss or damage due to such deviation, except to save life but not property. It is usual, however, to insert in the B. of L. specified 'liberties;' the quantities and condition of the goods at the time of shipment must be described, as the contract is to deliver that quantity in the same condition. A 'clean bill' is one where the goods are not described with qualifying words, such as 'cases one or three in damaged condition,' or the like. The contract is to deliver at a certain place; the shipowner is liable if he does not do so, if his failure is due to one of the perils excepted, or if, for example, war has closed the port. The B. of L. generally contains the name of the consignee to whom the goods are to be delivered, and usually adds to his 'order or assigns.' He can then transfer his rights and liabilities to a third person by indorsing his name and delivering the document. The bill thus becomes a negotiable instrument, and can be re-indorsed on. On payment of freight the indorsee receives delivery of the goods. The amount of freight is either stated in the B. of L., or reference is made to the terms of the charter-party. The 'excepted perils' are those causes of loss or damage which exempt the shipowner from liability. The common law exemptions were 'act of God,' *i.e.* every act in which man has no part; and the act of the 'king's enemies,' *i.e.* from war. The tendency nowadays is to include a large number. The shipowner is presumed to undertake absolutely that the ship is seaworthy, and that all reasonable care will be taken by his servants and agents. It may be noted that by English law a shipowner may make any exceptions, but in the United States an act of 1893 forbids the insertion of terms exempting the owner from liability for loss through his servants' negligence. Finally, the shipowner has a lien on the goods for freight by common law, and by the terms of the B. of L., usually for demurrage. *See* Scrutton, *Charter Parties and Bills of Lading*, 1904.

Bill of Mortality. In the 16th century in England, when there was much plague, the par. clerks issued a weekly statement, a B. of M., showing the number of deaths and the causes that had occurred in each par. based on the reports of 'searchers.' They are said to date from 1538, when par. registers were estab. They were regularised in 1603, and continued till the Births and Deaths Registration, 1836, was passed. The age of the persons dying was not inserted till 1728, from which dates the science of life-insurance.

Bill of Rights, the name commonly given to the act declaring the rights and liberties of the subject, and settling the succession of the crown, 1689, which embodied the Declaration of Right drawn up by a committee of the Commons and presented to William, Prince of Orange, and his wife, afterwards William III. and Queen Mary. After declaring the crown vacant by the abdication of James II., the following acts are declared illegal: the suspending or execution of laws by royal authority without consent of parl.; the power to dispense with laws; the establishment of courts, such as the commission for eccles. causes; the levying money by prerogation without consent of parl.: the raising or keeping of a standing army in time of peace within the kingdom without such consent. The right to petition the king, the freedom of parliamentary elections, the freedom of speech in debates, and the necessity for frequent parls. are asserted. The rest of the act is concerned with the settlement of the crown, to be superseded by the Act of Settlement, 1701. The B. of R. is the nearest approach to a written constitution which the United Kingdom possesses. Its provisions, so far as applicable, were embodied in the United States constitution.

Bill of Sale, a form of legal document, by which the grantor transfers to another (the grantee) the ownership, while retaining the actual possession, of personal chattels, such as goods, furniture, and other articles capable of transfer by delivery, including fixtures and growing crops, when assigned and charged separately from the building or land to which they are attached. Bs. of S. may be *absolute*, where the chattels are sold absolutely; they must be attested by a solicitor; the regulations as to such Bs. of S. are laid down in the Bills of Sale Act, 1878; non-compliance does not void the B. of S. as between the parties, but only as against the trustee in bankruptcy and execution creditors of the grantor. More important are the second class, Bs. of S. *by way of security for the payment of money*; they must be made in accordance with

the form given in the Bills of Sale Act, 1882; which can only be departed from in verbal differences. The bill must be by deed, must contain the names and addresses of the borrower and the lender of the money for which it is security, the amount lent, and the interest: the assignment as security of the chattels, of which an inventory must be attached; the time when the money lent, and interest, will be repaid; a covenant to insure the goods and pay all rent, rates, and taxes due on the premises where they are. The lender stipulates that the goods will not be seized except for the reasons set out in sec 7, viz.: (1) Default in payment and covenants; (2) Bankruptcy or distraint for rates, rent, or taxes; (3) Fraudulent removal of the goods; (4) Unreasonable refusal to produce last receipts for rates, etc.: (5) Execution under a judgment. A B. of S. must be witnessed and stamped in accordance with the scale, and registered within seven days of its execution. As trade protection societies publish all such registrations, a B. of S. damages a grantor's credit. All Bs. of S. not complying with the regulations of the Act are void. There are no Bills of Sale in Scotland.

Bill of Sight, a document given by an importer of goods to a customs officer, containing as good a description as possible of the goods, when a full description cannot be given. The goods can then be landed, but the full description must be given within three days.

Bill of Store, a permit granted by the customs house to reimport British goods without payment of duty such as would have been imposed had they been foreign goods. It must be within five years of exportation.

Bill of Victualling, or **Victualling Bill**, an order given to the master of a vessel by a customs-house officer for the withdrawal from bond or for drawback of such stores as are necessary for the crew and passengers. Stores not on the bill, or if landed in the United Kingdom without authority, are liable to be forfeited and destroyed.

Billardiera, or, as it is sometimes is a shrub natural order ound in Australia, but some species of it are cultivated in Eng. glasshouses. It bears a fruit which, when ripe, is generally somewhat bluish in colour, and which possesses a rather strong resinous flavour.

Billaud-Varenne, Jacques-Nicolas (1756-1819), a notable Frenchman and revolutionist, the son of an advocate, was born at Rochelle. His early home influences were bad, his parents being both of weak character. He joined a religious sect when he was nineteen, but did not bind himself by vows; he worked instead at literature. In 1785 h afterward self as an advocate in the parlement. Political matters then absorbed his whole attention, and in 1789 he pub. three vols. at Amsterdam. From that time he became an acknowledged revolutionist. In 1791 he pub. *L'Acéphalocratie*, for which he was obliged to hide for a time. In 1792 he was elected deputy-commissioner of the national convention. He immediately worked for the abolition of monarchy. When the trial of Louis XVI. took place, he voted for 'death within twenty-four hours.' He was prominent in the overthrow of the Girondists in 1795, and in the same year he was made president of the convention, and member of the committee of public safety. Soon after this he St. Domingo, where he died.

Bille, Steen Andersen (1797-1883), son of a Danish admiral. He served in the Fr. marine during the campaign of 1823, was made rear-admiral and minister of the marine in Denmark, commanded an expedition round the world, and wrote an account of it.

Billet, in architecture, is a style of ornamentation, belonging to the Norman period, of which the distinctive feature is the rounded arch. The B. was formed by cutting a round moulding into notches, so that the remaining parts had the appearance of small logs. In the transitional period the B. moulding disappeared.

Billet, in heraldry. Although Bs. are common in armorial bearings, their representation is uncertain. Some suppose them to represent bricks, and others letters. 'Billety' signifies that the charge is uniformly covered with Bs. The best known instance of this is, no doubt, the coat borne on an escutcheon over the arms of England during the reign of William and Mary.

Billeting, or **Cantoning**, as it is called, is a means of lodging officers and soldiers among the inhab. of a dist. Since the Army Act of 1881 B. is limited to the extent that only public-ho and hotel-ke have soldiers and keepers of livery stables to tend their horses. If the keeper of the house is unable to provide room, he is obliged to obtain accommodation in the vicinity. In Britain B. is resorted to when the troops are called out to assist civil authority, or when cavalry

are on a long march. Barrack accommodation would be utilised whenever possible, and infantry usually travel by rail. In the United States the consent of the householder is a *sine qua non* in time of peace, and B. in war time is regulated by legislation. In continental countries, however, B. prevails to a much greater degree; no fewer than eight or nine men and three or four horses may be quartered on one private house during army manœuvres. The sustenance for men and horses is provided by the commissariat. The early stages of a campaign are more favourable for B., as the movements of the enemy are uncertain, and the position undefined.

From earliest times, when the monasteries afforded hospitality to soldiers, the system of B. has been in vogue. Natural and cordial resentment has invariably been aroused by these arbitrary proceedings, and the third article of the Petition of Right, passed in 1628, bound the king 'not to billet soldiers on private individuals.'

Billiards, a game of skill. It consists in the driving of balls against other balls or into pockets by a long stick called a cue. The table used is rectangular. The origin of the word is perhaps from the French *bille*, meaning a stick. Obscurity surrounds the first adoption of the game, and the various countries of Spain, Italy, and France are each said to have originated the game by different authorities. Shakespeare mentions the game in *Anthony and Cleopatra*, and further reference is made to it in Cotton's *Compleat Gamester*, 1674. Formerly the game was played on a lawn as croquet, and gradually the evolution of the B. table took place from a square table with one pocket in its centre to the modern Eng. table, rectangular in shape, with six pockets at openings in the cushions, one in the middle of each longer side and one at each corner. Fr. and American varieties of the game are played without pockets.

Eng. B. is played on a table of a hard wood (generally mahogany) frame, with six legs. These legs are sufficiently strong to support the weight of five slabs of slate measuring 2⅝ ft. by 6 ft. 1½ in. These are fitted together with the greatest care to present an accurately even surface, and covered with green cloth of fine

raised from the floor at a height of 2 ft. 8 in. On the cloth are marked three spots of black in a line running down the centre of the table. At one end of the table is a baulk line drawn from side to side with an arc towards the cushion in the shape of a D. This is the full-size table, and smaller ones are made in proportion. In the beginning of the 19th century the bed of the table was of hard wood and the cushions of layers of list. About 1835 the minimum of elasticity afforded by the list cushions caused their displacement by those of rubber. This possessed the drawback that cold weather caused a hardness to lessen the possibilities of rebound, and a composition was eventually invented which fulfilled practically all conditions. The mouth of the pocket is called the 'drop,' and here the cushion corners are sloped away to ease the passage of the ball. Ordinary tables have pockets from 3⅛ in. to 3⅜ in.

There are three chief varieties of the game, B., pyramids, and pool. Only in B. are any points counted when a ball is driven to touch two others in its course. This is called a 'cannon.' A 'hazard' is the stroke that is made to play a ball into a pocket. The balls are three in number, and two of them are white, the other being red. The two white balls are 'spot' and 'plain' respectively, as one has a spot marked upon it to distinguish it from the other. Their shape should be perfectly spheroid. The substance from which they are made is ivory, though the property of this material in possessing parts that vary in resistance proves a fault. Other inventions are various celluloid compounds, such as crystallate, bonzoline, and hollow steel, but their elasticity is still inferior to that of ivory. A rod of ash forms the cue. This is rounded and is about 4 ft. 9½ in. long. It tapers from the butt end, which is 1½ in. in diameter, while the tip is about ½ in. in diameter. On the tip is a leather cap covered with chalk on account of its liability to slip off the smooth surface of the ball on striking. To give the cue weight and driving power a splice of ebony or other heavy wood is let in the butt end. While formerly it was permissible to use the butt end in difficult strokes as far as convenience of attitude was concerned, all strokes now must be made with the tip. In striking, one hand holds the cue at the butt end, while the other forms a 'bridge' upon which the cue slides towards the ball it is intended to drive.

The object of the game is to register 100 or more (as arranged) points by means of the scores obtained by hazards and cannons. Two opponents usually partake in the game, though four may by arrangement. For each red hazard, *i.e.* pocketing or going in off the red ball, three points

are awarded; for each white hazard, two; and for a cannon, two. Various penalties are: driving your ball off the table or pocketing your own ball without contact with any other forfeits three points, and ordinary miss strokes lose one. The red ball is replaced upon its spot (the topmost one) after it has been driven into a pocket. Should that spot be covered by another ball it goes on the next spot, which is called 'pyramid' spot. An opponent's ball, if pocketed, is to remain there till his turn arrives. It is then placed in any part of the D from which area it was driven at the beginning of the game. On making a score the successful player is entitled to continue until his efforts yield no further points. When this happens his 'break' is finished. Hence there is no limit to the score of a player's break.

In order to commence the game the players stand at the baulk end of the table. The red ball is placed on the furthermost spot and the player starts to 'break' the balls with 'spot' or 'plain,' whichever he has selected. It is necessary, in order not to forfeit a point, for him to cause his ball to strike the red, though an advantage is his if he is sufficiently expert to play his ball back into baulk, purposely missing the red ball, for the position left to his opponent by this manœuvre is difficult. During the game it is possible to pocket the red ball and with the same stroke to cause a cannon in its continued path. In this case five is scored, three for the red hazard and two for the cannon. Again, it is possible for him to pocket both the red and his own ball. In this case six is scored, three for each hazard, for a ball that enters the pocket off the red ball scores a red hazard.

The various degrees of control exercised upon the path of the ball depend upon the condition of the leather cue tip and the accuracy of judgment with which the stroke is made. A ball is given 'side,' *i.e.* curve, by striking it towards the side, while a drive levelled at its base tends to cause the ball to travel in the opposite direction to that apparent to the novice. Great circumspection is necessary if success is desired in the game, as so much depends upon the position in which a player leaves his opponent. In some positions it is possible to arrange by clever play the position of the balls subsequent to the stroke, and if this stroke be one that scores, the following break is limited only by ability to control the nerves of the player. Many of these strokes are disallowed in matches, but one of them is the famous anchor stroke. This stroke is made when the balls are near a corner of the table, standing in the form of a triangle. With a good knowledge of [illegible] restraint in can score a balls to thei two points, till his arm is too tired to control longer. This is even more easily accomplished when the two object balls are jammed at the mouth of a pocket, and it is on record that F. C. Ives against J. Roberts, jun., made 1267 such cannons. Similar positions, whereby the game was rendered at that stage uninteresting, have received the attention of the game authorities, and where the position invites this play, it is mutually arranged to break it deliberately. Many difficult shots present themselves in the course of a game. Among these is the massé shot, which requires the cue to be held almost perpendicularly above the ball and a downward drive to be aimed at its side.

The various billiard champions by their excellence of graceful combination in the matter of strokes have caused the popularity and development of B.

Pyramids is played by two or more persons. Fifteen balls are used. They are arranged in the form of a triangle or pyramid, whose accuracy of arrangement is assisted by a wooden frame. The apex faces the players. They have a white ball with which to strike, while the others are coloured. The object is to pocket as many balls as possible, scoring thus completely by hazards. The players, using the same white ball, strike at the apex of the triangle and play alternately, succeeding each other on the cessation of breaks. The balls are slightly smaller than B. balls.

Pool also consists of winning hazards, and is shared by two or more persons. A certain stake or pool is formed by subscriptions from the players. Each player has three chances or lives at the beginning. A coloured or numbered ball is played by each participant. The white ball is placed upon the spot, and the player's ball is directed at it from baulk. If he pockets an opponent's ball he demands the price of a life from its owner. Varieties of this game are black pool, single pool, and snooker pool.

Billing, Archibald (1791-1881), physician, was on the staff at the London Hospital, and was the first to give clinical lectures with regular bedside teaching, and to insist on the study of auscultation. Afterwards, as a member of the senate, he became examiner in medicine.

Billings, a city and the cap. of

Yellowstone co., Montana, U.S.A., on the N. Pacific Railway. It is noted for sheep and cattle raising. B. is also a tn. in Christian co., about 20 m. from Springfield.

Billings, Josh, *see* SHAW, H. W.

Billings, Robert William (1813-74), architect and author, was born in London. He became a pupil of John Britton, a prominent topographical draughtsman, when he was thirteen, and during the seven years of his apprenticeship he developed tastes for illustration. In 1837 he illustrated a *History and Description of St. Paul's Cathedral*. In 1839 he illustrated Mackenzie's *Churches of London*, also assisted Sir Jeffery Wyatville with drawings of Windsor Castle. The greatest achievement was his work *Baronial and Ecclesiastical Antiquities of Scotland*, and in this his name lives. He directed the restoration of the chapel at Edinburgh Castle, and the Douglas room in Stirling Castle. He died at Putney.

Billingsgate, a fish market in London, situated on the banks of the Thames, close to London Bridge, and to the W. of the Custom House. It was opened in 1558 as a landing-stage for provisions, and was estab. in 1699 as a free and open fish market. It was rebuilt in 1852, and again in 1874. The name of B. has long been a synonym for abusive variegated language.

Billington, Elizabeth (*c.* 1768-1819). English singer, born in Soho, London. She was the daughter of a German musician, by whom she received her first musical training. She was a child of eight years when she made her first appearance as a pianist at the Haymarket. She commenced her singing career when she was fourteen, and about two years after she secretly married her singing master, a Mr. B. The couple went to live in Dublin, and it was there that she made her début in opera, taking the part of Eurydice. In 1786 she returned to London and accepted an engagement at Covent Garden, at a salary unheard of at that time. She then gave a command performance before royalty. A contemporary states that her voice was of 'great sweetness, compass, and power,' and that she possessed 'a great deal of genuine beauty with charming manners.' At different periods of her life she studied under Paer, Himmel, and others. Her married life was not happy. She was twice married. The second union was more unhappy than the first, and she left her husband in 1801. Her reappearance in London was enthusiastically welcomed. Sir Joshua Reynolds painted her portrait. She died probably at Venice.

Billiton, an island belonging to the Dutch E. Indies, situated between Borneo and Banca. It is about 55 m. long, 44 m. broad, and in area 1800 sq. m. Its coast is fringed with coral reefs and rocks, which render it difficult of access. It is marshy and sandy, but the interior is somewhat hilly, being at an altitude of nearly 3000 ft. The is. is noted for its tin mines, numbering over eighty. The exports are rice, sago, nuts, gum, tortoise-shell, etc. Pandang is the chief tn., and Tandjong is the harbour. Pop. (1906) 38,000.

Billom, a tn. in Auvergne belonging to the dept. of Puy-de-Dôme, France. It is situated about 15 m. S.W. of Clermont. The trade, which is not great, consists of thread manuf., linen, corn, and cattle. There is a hydropathic hotel in the neighbourhood, and a very ancient church. Pop. (1906) 4725.

Billon is the name used for a metal which consists of silver or gold, with a greater proportion of a baser metal, *e.g.* copper. This is sometimes used in coinage. The word is of French origin.

Billot, Jean Baptiste, a Fr. general, born in 1828. He served with great distinction in Algeria until he was recalled to take command of the 18th Corps d'Armée on the outbreak of the Franco-Prussian War. He was elected a life senator in 1875, and was Minister of War in the De Freycinet cabinet. General B. vigorously opposed all attempts to restore the monarchy and played an important part in the passing of the bill for the reorganisation of the staff of the army and for opening it to all ranks. He retired with the Méline cabinet in 1898.

Billroth, Theodor (1829-94), one of the foremost surgeons of his day, born at Bergen. He took his doctor's degree at Berlin, but his chief work was done in Vienna. He was a bold but humane operator, and was the first surgeon to perform an operation for cancer in the stomach. During the Franco-German War he served voluntarily in the military hospitals, and his practical work there, together with a famous speech on the War Budget, made him chiefly instrumental in bringing about several great reforms in the transport and treatment of the wounded. He wrote *Allgemeine chirurgische Pathologie und Therapie* and other works.

Bilma, an oasis in Sahara on the route from Tripoli to Kouka. It is noted for its salt mines, and for its salt-water lakes, from which, by evaporation, great quantities of salt are obtained, and which is the object of immense trade with countries in Central Africa.

Bilney, Thomas, Eng. preacher and martyr, born probably near Norwich about 1495. His education took place at Trinity College, Cambridge, and his ordination in 1519. He preached against formalism, and the worship of saints and relics; and his saintly influence caused such men as Latimer and Matthew Parker to be won over. In 1525 he was licensed to preach in the Ely diocese, and, while quite orthodox in the main, accepting the pope's authority, he still denounced the saint and relic worship. In 1527 he stood his trial as a heretic by Wolsey, and was imprisoned for a year in the Tower. He again began his preaching, but was once more arrested and condemned. He was burned at the stake in Norwich, 1531.

Biloculina, the name given by D'Orbigny to a genus of minute protozoans of the family Miliolidæ and order Testacea. They are marine animals.

Biloculina, in geology, are a genus of Foraminifera which are found in the tertiary deposits of the North Sea.

Biloxi, a city in Harrison co., Mississippi, U.S.A. It is on a branch line of the Louisville and Nashville Railway, and is a summer and winter resort for the residents of Mobile and New Orleans. It does a large trade in packing and shipping fruit, vegetables, and oysters. Pop. 6000.

Bilse, Oswald Fritz, a Ger. lieutenant who in 1903 pub. *Aus einer Kleinen Garnison*, a book dealing in an unpleasantly realistic manner with the darker side of garrison life in Forbach, a provincial Ger. tn. The book has been trans. into Eng. as *Life in a Garrison Town*. The Ger. ed. was suppressed in the year of its publication, and B. was sentenced to six months' imprisonment, and dismissed from the army. The authorities, however, were compelled to acknowledge the truth of some of B.'s statements.

Bilston, a tn. in England, situated in the co. of Staffs. It is 3 or 4 m. from Wolverhampton, is served by the Great Western, and London and N. Western railways, and is one of the iron-smelting centres. There are considerable manufs., which consist of: heavy iron goods—bars, machinery, engines, bedsteads, iron and brass castings, wire, etc.,—tin, enamelled goods, japanned ware, and pottery. A hard stone is found in the neighbourhood which is utilised for grindstones, and also a fine sand, for casting, is obtained. Pop. (1911) 25,681.

Bima is a seaport, and the cap. of the is. Sumbawa, belonging to the Dutch E. Indies. The is. is specially renowned for its teak forests and tamarinds. The exports are timber and horses.

Bimana, derived from the Lat., 'two-handed,' is a term which was used [illegible] famous Ger. [illegible] human being [illegible], or four-handed mammals. This term was generally used, until Professor Huxley in his lectures, and especially in his work, *Man's Place in Nature*, drew attention to the obvious fact that B. could not be limited to mankind, but could as well be used to describe many of the higher apes. The term has fallen into disuse now.

Bimbia, a riv. of W. Africa, which enters the Bight of Biafra, to the W. of the Kamerun R. It is known in its upper course as the Mungo River.

Bimetallism, the employment of both silver and gold coins as standard money or legal tender. It must be noted at the outset that the use of coins of both metals in Britain does not constitute B., because the standard is gold, and the silver and bronze coins are merely tokens. That is to say, the value of the silver in twenty shillings is by no means equal to the value of a sovereign; the silver coins are minted for convenience in dealing with small amounts. The distinction is marked by silver not being altogether convertible, as it is not legal tender for amounts over forty shillings, and, on the other hand, silver may not be taken to the mint and freely converted into coinage. When gold and silver are both standard money, more or less freely convertible, a competition is set up which has disturbing effects on trade. Let it be supposed that by reason of new discoveries of metal, the relative abundance of silver suddenly becomes greater. As metal it becomes cheaper, it is freely offered for minting, and the value of other commodities, including gold, increases; because abundance of money invariably means a rise in prices generally. Gresham's law, which may be shortly stated as 'bad money drives out good,' now comes into operation. Gold will be used in dealing with other countries where the gold standard only is maintained, and is thus driven out of the country. It has been observed that quite a small decrease in the relative price of silver is sufficient to encourage it [illegible] quantities into [illegible] recognised as le[illegible] say, where the amount of gold or other commodities to be obtained for it is greater in value than in non-silver-standard countries. It is obvious, therefore, that the only way of preventing a large and disturbing transportation of one element of a double coinage is an agreement, internationally, to recognise both metals in the

same ratio of value. This, then, is what the advocates of B. desired. It was hoped that if all the commercially important countries agreed to fix the ratio of the value of gold and silver at 15½ to 1, it would be possible to maintain that ratio by regulating the demand, *i.e.* by increasing or decreasing the coinage of gold or silver, and so stimulating or discouraging supply. The advantages claimed for a fixed ratio are greater stability in value of commodities generally, since there is likely to be a compensatory supply of one metal if the production of the other diminishes; the avoidance of depending on one metal, the supply of which may not be equal to the work required to be done; and the possibility of establishing a world-currency, with consequent advantages to commerce universally. The great weakness of the case for B. has been the difficulty of establishing and guaranteeing the permanency of the desired fixed ratio. The influence of many important countries in adjusting the supply and demand of the precious metals would no doubt be enormous, but the conflicting interest of different countries would create difficulties as to the manner in which that influence should be exerted. This is well illustrated by the conditions which led to the bimetallic controversy. Between 1848 and 1860 great discoveries of gold took place in California and Australia. France, America, and the principal European countries except Britain had a double coinage standard, and gold was minted in large quantities, a large amount of silver being exported to India and other countries having a silver standard only. After 1870 the production of gold diminished, and that of silver increased enormously. The consequence was a general rush to mint silver and the operation of Gresham's law in causing the exportation of gold. An attempt to restrict the coinage of silver threw it on the market as metal, and caused a further fall in price. The Indian government, as large holders of silver, and the silver producers of America, thus suffered considerable loss. A great agitation now sprang up, chiefly in America, to bring about an international agreement to fix a ratio and make a double standard universal. Money conferences were held in Paris in 1878 and 1881, but without effect. Through the efforts of the United States, another conference was held at Brussels in 1892, but the opposition of Britain and Germany again prevented the establishment of a silver standard. An attempt was then made in America to establish a bimetallic standard for that country independently of Europe, and the presidential elections of 1896 and 1900 were fought mainly on that issue. The unwisdom of the step was generally recognised by the American electorate, and the controversy gradually dropped. The increased output of gold in Australia and South Africa helped to adjust the situation, and the adoption of the gold standard by Austria, Russia, Japan, and Mexico has helped to make it practically universal. The position at the moment of writing appears to be that the principal states are reconciled to the permanent establishment of a single standard. The bimetallic controversy may be studied from the point of view of the bimetallist in *International Bimetallism* by F. A. Walker; the opposing side is represented by Giffen in *The Case against Bimetallism*; whilst an impartial view is adopted by Leonard Darwin in *Bitmetallism*.

Bimlipatam is the chief port of the Vizagapatam dist. in the Madras presidency, British India. It is situated on the Bay of Bengal, about 18 m. N. of Vizagapatam. There is a large coasting trade, and its chief exports are sugar and oil seeds.

Binab is a Persian tn. in Azerbaijan, situated on the Sou-chai, about 55 m. S.W. from Tabriz. It is surrounded by vineyards and orchards.

Binan, or **Vinan**, pueblo of Laguna prov., Luzon, Philippine Is., on a trib. of Laguna de Bay, 41 m. from Santa Cruz. Very fertile.

Binary Theory, a generalisation in chemistry which is now of historical interest only. It assumed that every chemical compound consisted of two parts which might be elements, or groups acting as elements, one element or group being electro-positive and the other electro-negative. The theory cannot be said to have any general value in the chemistry of to-day.

Binche, a tn. of Belgium, situated in the prov. of Hainaut, 10 m. E.S.E. of Mons; pop. 13,000.

Binck, or **Bink**, Jacob (*c.*1500-*c.*60), German painter and engraver, born at Cologne. He studied under Dürer, and also, perhaps, in Italy. His engraving is very unequal, and among his best productions may be named the 'Divinities of the Fable' and his various portraits.

Bindusāra (297-272 B.C.), second Mauryan Emperor of India; son of the great conqueror Chandragupta, and father of the still greater Asoka, who succeeded him.

Bindweed, the name given to sev plants of the order Convolvulaceæ, which climb by means of twining stems and are natives of Britain. The

name is most often applied to the sweet-scented *Convolvulus arvensis*, or lesser B. *Calystegia sepium*, larger B., often occurs in hedges, and is fertilised chiefly by means of a hawk-moth; *C. Soldanella*, sea-B., grows on the coast. The name black B. is given to *Polygonum convolvulus*, a species of Polygonaceæ.

Bingen, a tn. of Hesse-Darmstadt in Germany. It is situated on the l. b. of the Rhine, about 15 m. W. of Mainz, and 40 m. S.E. of Coblentz. Near the town is the well-known Bingerloch, a whirlpool, which was at one time a most dangerous passage for navigation, until 1834, when the sunken rocks were blasted, leaving a wide channel of 210 ft. The Mäuseturm, or Mouse-tower, is situated on a rock in mid-stream, the scene of the story of Bishop Hatto. The remains of a castle where the Emperor Henry IV. was imprisoned are in the neighbourhood, and almost opposite B. is the statue Germania, which was erected in 1877-83 in commemoration of the war in 1870. B. is the centre of a wine-producing neighbourhood, and is also the market for the sale thereof. Pop. (1906) 7600.

up to the Niger, and two years later he arrived at Grand Bassam. He described this journey in his work *Du Niger au Golfe de Guinée par le Pays de Kong et le Mossi*, pub. in 1891. In 1892 he again visited the Guinea Coast for the purpose of superintending the forming of the Eng. and Fr. boundaries.

Bingerville, a tn. of W. Central Africa, situated a little to the N.W. of Grand Bassam. It is now the cap. of the Fr. Ivory Coast, having been constituted in Nov. 1900.

Bingham, Joseph (1668-1723), an Eng. divine and learned scholar, born at Wakefield in Yorkshire. He was educated at Oxford, and was made fellow of his college in 1689. Two years later he was appointed college tutor. After some time he was forced to give up his work, resign his fellowship, and leave the university because of an accusation brought against him of heresy. The foundation for this aspersion originated from a sermon which he preached upon the word 'Person' as applied to the Trinity. Very shortly after, a living was given him at Headbournworthy, close to Winchester, and it was here that he wrote his great work, entitled *Origines Ecclesiasticæ, or Antiquities of the Christian Church*, in ten vols. His first vol. was pub. in 1708, and the last in 1722. In 1712 he was given the living of Havant, Portsmouth. Nearly all his money was lost in the South Sea Bubble, 1720.

Binghamton, a city of New York, situated at the junction of the [illegible] *hanna rivs.*, and It is the cap. an enterprising tn., well laid out. Its manufs. are boots and shoes, tobacco, cigars, flour engines, etc., Pop. 45,000.

Bingley, a market tn. in W. Riding, Yorkshire, England. It stands on the Aire, about 6 m. from Bradford, and 15 m. from Leeds. It is served by the Midland Railway. Its manufs. are woollen goods, worsted, cotton, paper; there are extensive iron works in the neighbourhood. It possesses sev. fine buildings; among them are technical schools, a free library, a cottage hospital, etc. Pop. (1911) 18,759.

Binh-Dinh, tn. of Annam, Fr. Indo-China, 11 m. from the coast and 205 m. S.E. of Hué. Kwinhon, or Quinon, is its port. Pop. 75,000.

Binnacle is a framework or case or box in which is kept the nautical pass. It is fitted with lighting ratus, so that the compass can be at night. It is as a rule placed he deck of a ship, in front of the rsman. A double B. is occasionally ied, one on each side of the steer-wheel. On board a man-of-war, one B. is for the use of the officer on watch, while the man at the wheel has the other. At one time the B. was just a locker with sev. compartments, to contain the compass, lights, watch-glasses, etc. In the middle div. was placed the small lamp, and as the sides were of glass, a light could be thrown on the compass all the time at night. The modern B. has been improved, for it is so constructed that the compass needle is made proof against vibration or shocks. A B. list is a list of the names of sick men on a man-of-war; it is generally placed near or in the B. for the scrutiny of the officer on deck duty.

Binney, Edward William (1812-81), geologist, was born at Morton, Notts. He was articled to a solicitor in Chesterfield, and in 1836 went to Manchester, where he practised successfully as a lawyer. His leisure was devoted to the study of geological phenomena of the district. Chiefly through his influence the Manchester Geological Society was formed in 1838. From 1857 to 1859 he was president of the society, and also from 1865 to 1867. In 1853 he was elected a fellow of the Royal Society. He studied with great diligence, and was considered to possess the most

accurate knowledge of the coalfields of Cheshire and Lancashire. He died at Manchester.

Binney, Thomas (1798-1874), a Congregational minister, was born at Newcastle. He received his education from an ordinary day school, and then was apprenticed to a bookseller for seven years. During this time he studied hard at Lat. and Gk. Later on he entered a theological college to prepare for the ministry. His first call was to the Isle of Wight in 1824. In 1829 he took up work at Weigh House Chapel, London. He was strongly against the Church of England. In 1845 he visited Canada, and in 1857 he went to Australia. He ranked high among nonconformists of his time.

Binnie, Sir Alexander Richardson (*b.* 1839), engineer, born in London; educated at private schools and under J. F. Bateman, F.R.S., president of the Institute of Civil Engineers; was engaged on Welsh railways, 1862-6; in Indian Public Works Dept., 1868-74; was appointed engineer to the city of Bradford, 1875; chief engineer to the L.C.C., 1890-1901; created a knight, 1897. His engineering feats include the Blackwall Tunnel: Bradford Water-works; and Barking Road Bridge.

Binocular, *see* Optics.

Binoculus, a term formerly used instead of *Apus* for a genus of phyllopodous crustacea of the family Apodidæ. They inhabit fresh-water ditches, pools, and stagnant waters, and are gregarious. Males are seldom produced, the females carry their eggs about on specially modified appendages, and these eggs preserve the living principle for a long time in a dry state.

Binomial (Lat. *bis*, twice, *nomen*, a name), the name given in algebra to an expression consisting of two terms, as $a+b$, $a-b$. The *binomial theorem* is a method of expanding any power of a B. expression into a series. It is given in the following formula, where n may be any power integral or fractional, positive or negative, rational or irrational: $(x+y)^n = x^n + nx^{n-1}y + \frac{n(n-1)}{1.2}x^{n-2}y^2 + \frac{n(n-1)(n-2)}{1.2.3}x^{n-3}y^3 + \ldots + y^n$. Thus, the expansion of $(x+y)^5$ is $x^5 + 5x^4y + \frac{5.4}{1.2}x^3y^2 + \frac{5.4.3}{1.2.3}x^2y^3 + \frac{5.4.3.2}{1.2.3.4}xy^4 + \frac{5.4.3.2.1}{1.2.3.4.5}y^5$ or $x^5 + 5x^4y + 10x^3y^2 + 10x^2y^3 + 5xy^4 + y^5$. The theorem owes its origin to Sir Isaac Newton, who first pub. it in 1676, although he had devised it some years previously.

Bintang, the chief is. of the Rhiow archipelago, belonging to the Dutch E. Indies. It is situated on the S. of the Strait of Singapore. The coast is beset with rocks and small is., while the interior of the is. is low and marshy. Pepper, gambier, and rice are cultivated and exported. There is also a considerable trade in timber. The chief port is Tanjong Pinang. Pop. 18,500.

Binturong, a small black animal, found in India, Sumatra, Java, etc. It is frequently called a 'black bear cat.' It possesses a large head, and a very thick long tail, prehensile at the tip. Its habits are nocturnal and solitary, slow and crouching. It feeds upon birds and insects. Its howl is very loud. It is easily tamed.

Binyon, Lawrence, born at Lancaster, Aug. 10, 1869, son of the Rev. F. B., was educated at St. Paul's School and Trinity College, Oxford, and won the Newdigate Prize in 1890. He received an appointment in the dept. of Printed Books at the British Museum in 1893, was transferred to the dept. of Prints and Drawings in 1895, and became assistant-keeper in 1909. L. B. pub. *Lyric Poems* in 1894, and this work was followed by a number of others, among which may be mentioned *London Visions*, *Porphyrio*, *Western Flanders*, *Odes*, *The Death of Adam*, *Penthesilea*, *Paris and Œnone*, *Attilia*, *Painting in the Far East*, *England and other Poems*.

Biobio, the name of the largest riv. in Chile, S. America. It is 220 m. long. Its source is in the volcano of Antuco, in the Andes, and it takes a north-westerly direction to Concepcion, a port on the Pacific coast. It is more than 2 m. wide at its mouth, and is navigable for over 100 m. B. is also the name of a prov. of S. Chile. It has an area of 4158 sq. m., and is divided into three depts. The cap. is Los Angeles.

Biogenesis, a term used to express the theory that all forms of life owe their origin to antecedent life, as opposed to *Abiogenesis* (*q.v.*), which maintains that it may be possible to produce life from inorganic matter. The terms are used in connection with a biological controversy which recurs from time to time. B. is also expressed by homogenesis, which means that the living organism produces by sexual reproduction, spore-formation, or partition organisms resembling the parent, though the resemblance to the immediate parent may not, of course, be exact.

Biography (Gk. βίος, life, γράφη, writing), that branch of literature which deals with the history of the lives of individual men. The first known instance of the use of the word βιογραφία is in the work of Damascius,

a Greek writer of the early 6th century. The word does not appear to have been used in England until the 17th century. Fuller, in his *Worthies*, 1662, referred to the 'biographists of these saints,' and in 1683 Dryden defined 'biographia' as the 'history of men's particular men's lives,' in all parts of which 'Plutarch equally excelled.' B., in its most rudimentary form, exists in the early literature of all nations. The history of the lives of national heroes, coloured by popular imagination, may be traced in the myths of gods and giants and insuperable warriors. Jewish literature abounds in B., as it affects the history of the race. The *O.T.* is full of the lives of patriarchs, kings, prophets, and great women who left their mark on the religious and social history of the Jews. The earliest exam
written with a conscious
narrate the true history of
men, are probably to be found in Gk. literature. In Gk. and Rom. literature B. is generally a mere *curriculum vitæ*; the duty of the writer is to narrate, in strict historical sequence, the chief events of his hero's life. It often took the form of *laudationes funebres*, and the aim of the writer was strictly a moral one. His hero must either be an example or a warning. Every noble action is emphasised with grave eulogy; the consequence of every deed pointed out and solemnly censured. This form of writing gives ample opportunity for rhetoric, and for the introduction of lengthy dignified speeches in *oratio obliqua*, which deprive the work of any dramatic form, but add to its general moral tone. Xenophon's memoirs of his master, Socrates, is one of the earliest Bs. that have come down to us from the Gks. By far the most interesting is the *Parallel Lives* of Plutarch (A.D. 46-120). The *Lives* number forty-six, and the Gk. and Rom. heroes are arranged alternately as a parallel to each other. Plutarch far excels all anct. writers of lives. He is no scientific historian. His rare gift of sympathy with his subject and his powers of selection and of seeing what is interesting, are only equalled by the best of modern biographers.
peared in 157
had a remai
Elizabethan
of note, belo
are Philostratus' *Life of Apollonius of Tyana*, the Neo-Pythagorean saint, and his *Lives of the Sophists;* Diogenes Laertius' *Lives of the Philosophers* (3rd century); *Eunapius' Lives of the Sophists* (4th century); and the *Life of Plato*, by Olympiodorus of Alexandria. The Augustan age of Rom
fine specim
Illustribus (
655-730) is
accurate, but is of great interest. *The Life of Alexander the Great*, by Q. Curtius Rufus is not so much biographical as historical, and is overweighted with general reflections and rhetorical speeches. Tacitus' life of his father-in-law (*De vita et moribus Julii Agricolæ*), written A.D. 98, is a stately, dignified piece of work, and contributes greatly to our knowledge of the history of the times. The *Lives* of the Twelve Emperors, from Cæsar to Domitian, written by Suetonius Tranquillus about A.D. 120, are rhetorical studies. Suetonius shows indifference to chronological exactness, and is by no means an impartial
ther B. of some note is
by Sallust (*c.* 668-720)
acy of Catiline. Saint
Jerome's *Lives of the Fathers* belongs to a later period. The Bs. of the Middle Ages were frequently written in the cloister or the cell, and the subjects chosen were saints,
e like.
kind
(673-735) wrote lives on *St. Cuthbert* (one a metrical version of considerable length, and one in prose), and also *Lives of the Abbots of Wearmouth and Jarrow*, the material for which he found in certain anonymous lives of these saints. Aldhelm, Bishop of Sherborne (*d.* 709), composed a prose treatise in praise of virginity, which he illustrated by the lives of a number of men and women—Scriptural characters, hermits, monks, and saints—all of whom had proved themselves examples of chastity. Other lives of interest to the student of Early Eng. literature are: *Vita Sancti Columbæ*, by St. Adamnan (625?-704); *Vita Caroli Magni*, a life of Charlemagne, written about 820 by Eginhard; *St. Guthlac*, by Ælfric; *Wulfstan*, by William of Malmesbury; *Wilfrid of York*, by Eddius Stephanus; and *St. Guthlac*, by Felix. *The Life of Alfred*, by Asser, Bishop of Sherborne, has the distinction of being the 'earliest B. of an Eng. layman.' During the Elizabethan period of Eng. literature
was a fairly large output of this
of writing, but the form and
pe of B. did not develop to any
extent. Lat. was frequently chosen as the medium of expression, and the style and form modelled on that of Livy and Sallust. The chief biographies to be noted here are: *Illustrium Majoris Britanniæ Scriptorum Summarium*, 1584, by John Bale, 1495-1563; *De Viribus Illustribus*, and *Commentarii de Scrip*

toribus Britannicis, by John Leland (*d.* 1552); a *Life of Sir Thomas More*, by his son-in-law, William Roper (1496-1578); a graceful *Life of Cardinal Wolsey*, by George Cavendish (1500-*c.* 61), which remained in manuscript till the 17th century; and *History of the Life and Death of King Edward V. and the Usurpation of Richard III.*, by Sir Thomas More, written between 1513 and 1514, and printed in 1557. Bacon's *History of Henry VII.* appeared in 1621. Long, imaginary speeches are placed in the mouth of the chancellor, and the style is ponderous. But an effort is made to analyse the motives and purposes of the chief actor, and everything is subordinated to or explained by his actions. In this analytic handling of his subject Bacon made a clear advance on the methods of his predecessors. All modern biographies, which aim at giving an artistic and truthful presentation of the life and character of an individual, must acknowledge their debt to the admirable and altogether unique *Lives* of Izaac Walton. This series began by the publication in 1640 of the Life of Donne, which was followed by the Life of Sir Henry Wotton in 1651; Richard Hooker in 1665; George Herbert in 1670; and Dr. Robert Saunderson in 1678. Walton had a sympathetic understanding, so necessary to a good biographer; his pleasing style and the revelations of his own pious and kindly personality combine to make the *Lives* very attractive to modern readers.

Up to the present it will have been noticed that the men chosen as subjects of B. are those whose lives bear directly upon the history of the church and state. Mere men of letters were not considered to be of such influence and importance as to warrant a B. Even Walton's heroes were not wholly scholars. Drummond of Hawthornden's *Notes on Conversations with Ben Jonson*, 1619, though not, strictly speaking, a B., revealed the character of a man of letters in conversation, and proved that a man's character may be revealed in his trivial as well as in his serious remarks. From this time the scope of B. began to expand. Anthony à Wood (1629-95) chose the wits of Oxford for the subject of his *Athenæ Oxonienses;* John Aubrey (1629-97) pleasantly sketched the lives of his immediate predecessors and his contemporaries in *Minutes of Lives;* Thomas Fuller (1608-61) wrote extensively, with numerous digressions, of the notable men of each county in his *Worthies of England*, 1661. Mrs. Hutchinson, in *Memoirs of Colonel John Hutchinson* (1664-70, published 1806), wrote a panegyric of her husband, who had taken part in the Civil War. Thomas Sprat, Bishop of Rochester (1636-1713), reverted to the old classic models in his *Life of Cowley*, 1668, where he expounded that all familiar anecdote was out of place in a B., and that a moral effect was the thing to be aimed at. Before the end of the 17th century two lives of Milton were in print, one by Edward Phillips, pub. in 1694, and one by Toland, in 1699. Lord Herbert of Cherbury (1583-1648) and Anne Harrison, Lady Fanshawe (1625-80), were the earliest to write lives of themselves. Another early autobiography (1656) is that of Margaret Lucas, Duchess of Newcastle, who also wrote a life of her husband in 1667. With these autobiographies must be noted certain diaries, which were, after all, autobiographies not intended for publication. The most important of these is the famous *Diary* of Pepys (1633-1703), written between 1660 and 1669. Its value was unrecognised till the 19th century, and an incomplete ed. was first pub. in 1825 by Lord Braybrooke. This book is not merely valuable for the light it throws on the manners of Charles II. and the men of his day; it causes infinite delight for Pepys' complete and wholly unconscious revelation of his own little soul. Notice must be paid to the *Diary* of Evelyn, written between 1641 and 1697; to Roger North's *Life* of himself and *Memoirs* of his three brothers, the Lord Keeper Guildford, Dr. John North, Master of Trinity, and Sir Dudley, the Turkey merchant; and to Burnet's *History of His Own Times*. B. attained its most perfect form at the end of the 18th century in James Boswell's *Life of Dr. Johnson*. The necessities of a good biographical writer are numerous. He must, of course, have a knowledge of the bare facts and access to authentic documents relating to the life of his hero. But this is by no means all. Knowledge of facts and a strong predilection for moral platitudes were often, as has been shown, the sole qualifications of ancient biographers. But the ideal modern biographer should not merely be in touch, through his own technical knowledge, with the work and ambitions of his hero, but he should have a sympathetic understanding of his hero's character. He should be able so to present his hero that the reader is left with the feeling that he himself has known the man. Everything must be subordinated to the central figure; no incident, no person should be introduced that does not influence the life or the character of the hero. The

biographer must possess an innate knowledge of psychology: he must be able to analyse motives, and to arrange his material and group his characters to the best effect. In fact, in order to reveal the personality of his portrait he must create as well as reproduce. *The Life of Dr. Johnson* is thought by many to have no rival in the whole realm of the world's literature. Boswell had an unbounded admiration of his hero; an intimate knowledge that would be hard to surpass; and the happy knack of an artist in selecting and grouping his material. As Carlyle says, the 'loose-flowing, careless-looking work is as a picture by one of Nature's own artists; the best possible resemblance of a Reality; like the image thereof in a clear mirror.' Boswell, he says, was 'inspired only by love and the recognition and vision which love can lend.' Johnson lives for all posterity, not as a poet, story-teller, compiler, or even essayist, but in the pages of Boswell's immortal work. If, as Emerson said, a B. necessitates 'a great man to describe a greater,' Boswell's *Life* is an exception to the rule. Among the biographies, written by men almost as great as their heroes, are most prominent Boccaccio's *Life of Dante*, Dean Stanley's *Life of Dr. Arnold*, and Lord Morley's *Life of Gladstone*. Excellent biographies have been written in great number during the 19th century. The great modern classics in this branch of literature are Southey's *Life of Nelson* and *Life of Wesley*; Lockhart's *Life of Scott*; Forster's *Life of Dickens*; Trevelyan's *Life of* [illegible] *of Charles* *Lives of Joh* *Great*, *Schille* *Moore's Life* *Life of Charl* Martin's *Lif* and Dowden deviated from the ordinary form of B. in his *Life of George Eliot*, 1884. He arranged her letters in chronological order, headed by brief introductions or explanations, allowing her character to reveal itself in her correspondence. Cross' method has by many writers been adapted and combine modern Life and in his *L* to insert intimate illustrating the character of his hero). There have been, however, separate publications of letters only, of which those of special note are Cowper's, Matthew Arnold's (pub. 1895), and Robert Louis Stevenson's (pub. 1900). A great fault of some biographies is the lack of the power of selection in the author. A great amount of industrious research and scholarship is put into the work, but the biographer fails to present a living portrait of his subject. An example of this kind of work is Masson's *Life of Milton*. Masson gives a whole mass of information about the politics and lives of Milton's contemporaries, and introduces in detail and at great length many people and incidents which only very indirectly, if at all, bear upon the life and character of the poet. Sidney Lee's *Life of Shakespeare* is one of the finest examples of that type of B. which, of necessity, entails a great amount of careful and scholarly research. During the 19th century all manner of men have had their interest quickened in different branches of art and science, and to satisfy this natural and healthy curiosity, numerous biographies, autobiographies, and memoirs have been published. These have dealt with leading men in all the varied walks of life. Biographies have often been written by specialists of specialists: these are of such a kind as to demand a certain amount of technical knowledge of the subject from the reader, and therefore can only appeal to the few. Under this heading come lives of painters and artists, such as John's *Life of Mozart*, Karasowski's *Life of Chopin*, and Woltmann's *Life of Hans Holbein*. Autobiographies have been written in great number by all manner of men and women, such as Gibbon, Hume, Franklin, Talleyrand, Harriet Martineau, Oliver Wendell Holmes, Leigh Hunt, Scott (in his *Journal*), Ruskin (*Præterita*), Carlyle (*Reminiscences*), Goethe (*Dichtung und Wahrheit*), Sir Henry Taylor, Edmund Gosse (*Father and Son*), etc. Bunyan's *Grace Abounding*, Thomas Browne's *Religio Medici*, and Newman's *Apologia* are confessions of faith and revelations of the inward spiritual life of a man. Sometimes an autobiography has almost taken the form of fiction, as in Borrow's *Lavengro*, and not infrequently a writer has written his own life in a novel, and revealed himself in a special character, as, for example, Charles Dickens in *David Copperfield*. Halliwell-Phillips has said that the writing of modern biographies has been 'carried to a wasteful and ridiculous excess.' This is quite true. Every politician, man of letters, actor, and millionaire has some admirer or other who goes into print on his behalf. It is now quite customary for biographies to be written during the life of the subject, in which connection may be noted the recently published lives of Mr. G. Bernard Shaw and the Right Hon. D.

Lloyd George. Every little denomination and sect has its heroes, and lives and memorials are continually being published of philanthropists, preachers, and missionaries. Such works are of purely ephemeral interest, and reach a very limited audience.

The biographical dictionary dates from the 16th century, and first made its appearance at Zurich in Switzerland with the publication of *Bibliotheca Universalis* of Konrad Gesner. This was afterwards trans. into Lat. and Heb. (1545-9). Other early works of this sort are *Prosopographia* of Verdia de Vauprivas (Lyons, 1573); *Acta Santorum*, 1653; Pierre Bayle's *Dictionnaire historique et critique*, 1696. A dictionary of national B. was pub. in Sweden in 23 vols. from 1835-57. Other nations followed, and such dictionaries have appeared in Dutch (1852-78), Austrian (1856-91), and [illegible] the *English Dictionary of Biography* was started in 1882, under the editorship first of Leslie Stephen, afterwards of Sidney Lee. It has been issued in 63 vols., the last appearing in 1900, since when three supplementary vols. have been published, and others will continue to be issued from time to time. Other biographical dictionaries have been brought out in different countries, but are too numerous to be mentioned by name. Notice has been made of some at the end of this article. Nearly every country has now a *Who's Who*, which gives a brief outline of the life and work of living men who have distinguished themselves in various ways. Many biographies have been combined with works of criticism. Dr. Johnson was one of the first to use this form in his *Lives of the Poets*. Since then there have been many works of the kind, of which may be mentioned the critical essays of Macaulay, Carlyle, Matthew Arnold, Robert Louis Stevenson, Leslie Stephen, Bagehot, and of many living men of letters. The English Men of Letters Series has pub. admirable pieces of critical work by such men as Sir Walter Raleigh, Edmund Gosse, Austin Dobson, etc. There is a similar American series, and Fr. men of letters are celebrated in *Les grands écrivains français*. One of the earliest publications of a group of biographies was the famous *Lives of Painters* by Vasari (Florence, 1550). Other examples are: Foxe's *Acts and Monuments of the Church, or The Book of Martyrs*, pub. at Basel in 1559, and trans. into Eng. in 1563. Of more modern date, Hayward's *Sketches of Eminent Statesmen and Writers;* Cunningham's *British Painters, Sculptors, and Architects*, 1829-33; Mrs Jameson's *Early Italian Painters*, 1845; Bryan's *Dictionary of Painters*, 1879-85; Hamilton's *Poets Laureate of England*, 1888; Bellany's *Eminent Doctors;* Lord Campbell's *Lives of the Lord Chancellors* and *Lives of the Chief-Justices;* Doran's *Their Majesties' Servants*, 1864; Grove's *Dictionary of Music and Musicians*, 1879-85 (new ed.); Smiles' *Lives of Engineers;* Agnes Strickland's *Lives of the Queens of England*, of the *Tudor Princesses*, and of the *Last Four Princesses of the House of Stuart;* H. A. Müller's *Biographisches Künstlerlexikon der Gegenwart*, 1882. Some are of certain countries only, such as Appleton's *Cyclopædia of American Biography*, 1887-8, and Chambers's *Dictionary of Eminent Scotsmen*, 1835.

For cyclopædic biographical dictionaries, consult [illegible] *siastica*, 1704; [illegible] 1747-66; *Biogr* [illegible] Michaud's *Biographie Universelle*, 1811-28 (new ed., 45 vols., 1842-65); *The English Cyclopædia*, with biographical section, 1856-7; *Nouvelle Biographie Générale*, 1857-66; Chalmer's *Biographical Dictionary*, 1812-17; Spark's *American Biography*, 1834; Vapereau's *Dictionnaire Universel des Contemporains; Dizionario Biografico* of Gubernatis, 1880; Rose's *New General Biographical Dictionary*, 1829-47.

Biology (Gk. *βίος*, life, *λόγος*, discourse) has only one true meaning, *i.e.* its literal one, which is the science of life. As will be seen later, it is that science which endeavours to survey all the phenomena manifested by living matter. In other words it is the study of the action of life upon matter.

Two aspects of biology. — Tracing the history of all those who stand out pre-eminently in the realm of research in connection with sciences which deal with living matter, as opposed to those dealing with non-living matter, we are enabled to see how B. has developed from very simple observations of living forms into a series of complex sciences which give us particulars or data concerning living creatures or aspects of them: and how it is now gradually resolving itself into a comprehensive presentment of a unified and systematic account of organic matter. This last stage evidently depends upon and proceeds from the first; and while it gives us generalisations concerning living matter, and certain laws relating to its being, development, and growth—being therefore B. in its strictest sense—a cursory glance will show, and a study of the subject prove, that these generalisations can only be built up from the particulars gained from the primary aspect of

B. So that each branch is essential to the development of the other; and since the first aspect is by no means completed or exhausted, it follows [illegible] or our comlaws relating [illegible] n matter, are by no means perfect or complete.

History of the rise of biology.—Man in his most primitive form is gifted with the power of observation, and even the savage can divide living matter into its two great divisions of plant and animal. He can further divide these into tree, shrub, and herb, bird, beast, and fish; and in so far as he is able to do this he is to that extent a biologist. It can easily be seen, therefore, that developing powers of observation will produce two classes of naturalists: botanists and zoologists. Going back to the years 499-120 B.C. and looking over Greek history we find this division arising, for on the one hand we have Hippocrates studying the human body and discarding the old theory of disease, which attributed it to the wrath of the gods, in favour of more natural means, and Aristotle commencing to classify animals and speculating as to the differences between, and relative values of, life in animals and plants; and on the other hand we have Theophrastus classifying over 500 different kinds of plants into trees, shrubs, and herbs. Here we see the anatomist arising, and in the years A.D. 70-200 we have Pliny, the zoologist, and Galen beginning the study of the component parts of a living organism, by describing two sets of nerves and proving that the arteries contain blood. During the middle ages all science seemed to be lost in the glamour of alchemy, and little progress was made with the study of B.; but in the sixteenth century the science began to subdivide into still more particularly specialised subsciences. Vesalius proceeded further with the study of [illegible] ing to their seeds. Cæsalpinus followed this up and made the first system of plants on Gesner's plan, and further explained diœcious plants, *i.e.* those plants which produce separate male and female flowers on separate individuals. Each of these pioneers of the sixteenth century had sketched out a rough plan of classification, so that botany, zoology, and anatomy as the three subsciences of B. then extant were beginning to assume a scientific aspect. In the 17th century the progress was more rapid still. Fabricius Aquapendente discovered valves in the veins, and W. Harvey discovered the mechanism of the circulation of the blood, and the vessels which carry nourishment to it. This opened up a new branch of the science of anatomy, and from that time B. must be regarded as composed of the two subsciences of morphology and physiology, morphology being only concerned with the analysis of a living organism into its parts and taking no notice of the life which produced or is possessed by them, and physiology being concerned with living matter in action or with the functioning of the parts described by morphology. Harvey further commenced the study of embryology by asserting that all animals are produced from an ovum. Gaspard Asclius discovered the lacteal vessels which aid in the work of absorbing fat for the blood, and Rüdbeck discovered the lymphatics. Malpighi now took up the microscope, and applied it with immediate results to the study of physiology, finding air cells in the lungs and the Malpighian layer in the skin. With Grew he discovered the cellular structure of plants and stomates in leaves, and [illegible] the considera- of seeds. Ray classified the whole animal and vegetable kingdoms and laid the foundations of the study of the classifications anatomical, which led to the great generalisations of Linnæus in the next century. In the 18th century the advance of B. was even more rapid. In this century Boerhaave commenced the science of organic chemistry, the importance of which to B. can readily be seen when we notice the fact that he himself analysed milk, blood, etc., and showed that animal life can only prosper by the absorption of organic compounds. Dr. Haller of Göttingen worked on the subjects of muscular irritability, and the circulation of the blood, and started the work continued and extended by John Hunter involved in the study of comparative anatomy. Then Bonnet performed his experiments on plants and animals, and attempted once more the task of unifying the then known knowledge of the subsciences of botany, zoology, anatomy, morphology, physiology, and comparative anatomy and botany into B., by again putting forward the evolutionary theory of gradual development. Geographical distribution of animals on the surface of the earth was now added as a branch by Buffon, and then arose Linnæus, who invented a marvellous classification of plants and animals and founded the Artificial or Linnæan system of

anatomical classification. This may be explained as being founded on the differences in sexual characteristics and has never been entirely superseded; originating as it did the inestimably valuable categories of species, genus, order, and class. Again, Palissy the Potter originated in the 18th century the theory that fossils are authentic traces of extinct life, and so laid the foundations of the science of palæontology, which was further developed by Hutton in the same period, who taught that present processes were sufficient to explain the formation of stratified rocks and the existence of fossils. Wolff further emphasised the truth of Harvey's theory of the development of life from an ovum. The 19th century opened with Jussieu who passed on from the work of Linnæus with his description of external forms to the foundation of natural alliances based on the findings of comparative anatomy and so founded the natural system in botany, while Cuvier followed it up in the classification of animals. Bichat proceeded from the study of organs to the study of tissues (muscular, nervous, etc.), and so founded the science of histology. The[illegible] worked on the [illegible] by insects, and [illegible] e work was in the realm of embryological botany. Next came Lamarck, who once again raised the question of evolution through the gradual development of organs by reason of use or disuse through environment, and who was one of the first to commence the use of the word 'B.' Von Baer followed up the work of Wolff in the 18th century and placed embryology on a sound footing. Then Schleiden in the botanical and Schwann in the zoological aspects of histology improved on Bichat's work by resolving living organisms into cells, so founding the cell theory (1838). Dujardin and Van Mohl further resolved cells into protoplasm: while Virchow applied the cell theory to physiology and pathology; and Bernard applied the knowledge of the protoplasm to the study of the functioning of organ, tissue, and cell. In the second half of the 19th century, Darwin and Russel Wallace simultaneously developed the evolutionary theory beyond all previous efforts by their hypothesis of natural selection or the survival of the fittest. This was evolved to explain the facts that organisms are found to appear successively on the earth in types of ever-increasing anatomical complexity, and that the individual in its development from a single cell into a maturely complex organism repeats the same processes and tends to substantiate the truth of the theory of evolutionary descent of all living forms from a few simple prototypes. This theory evidently involves a conception of all our various specialised branches of B., and is an attempt to unify all this knowledge into one comprehensive whole. It therefore represents that aspect of B. which presents a unified systematic account of organic nature. This theory, having given an apparently reasonable explanation of biological development, seems to justify the general conception of evolution. It has therefore been adopted in sociology which must, as will be shown later, be considered as related to B.; and led to the development by Galton of the theory of eugenics, which seeks to elucidate all those agencies which affect racial qualities. Prominent with Darwin and Russel Wallace, as pioneers in the evolutionary theory, are Haeckel and Huxley.

Logical evolution of biology.—Thus if we wished to follow a logical sequence in the study of B., it would seem that commencing with living matter as a whole, we should first seek to know all the actual forms of life and then their classification into separate families, natural orders, classes, and sub-kingdoms, and so into botany and zoology. Then seeking further we should find ourselves searching in the realms of geographical distribution and palæontology for the facts relating to their distribution in present and past time respectively. From this an analysis of each form would give rise to anatomy, and comparison would involve comparative anatomy. Delving deeper for, and observing, the unity underlying these various forms we arrive in the realms of morphology by analysing the organism into organ, tissue, cell, and protoplasm; and searching here for details we arrive at the sub-heading of embryology. But we would now be face to face with the functionings of these organisms in life, and seeking to elucidate these in the processes of life we arrive at physiology, which also must be studied in terms of organism, organ, tissue, cell, and protoplasm. This in its turn will subdivide, as we search, into a study of the effects of environment, heredity, pathology, reproduction, and variation; each being studied under the five categories of organism, etc. Only after all these subsciences have been attacked and their main generalisations acquired, are comprehensive generalisations possible; and this, of course, is only possible when all the subsciences are complete. But the nearer they attain to completeness the more true are our generalisations,

and although the present state of the subsciences hardly allows for dogmatism in the science of B., yet it is at least possible to obtain a general partial presentment of the essential truths. These in turn are bound to give a directive influence on the subsciences, and must tend to a fuller and deeper and more accurate study of them. This comprehensive generalisation is undertaken in the Darwinian theory which, it must be borne in mind, is, in the first place, valuable because it causes a transition to be made from a gaining of specialised knowledge to an obtaining of a general view of organic nature. Now each branch of B. is studied in relation to the whole and in the light of evolution, and a new impetus has been added to the study which has caused it to loom more largely in the public estimation. So Darwin may be said to be the great populariser of the science, and further it may be said that he has raised the value of living matter as high in the world of science as life always has been in the world of thought. The Darwinian theory of Natural Selection is an explanation of the conception of variation, *i.e.* the departure of species from their average characteristics, regarded as being brought about by the struggle for existence. Although the evolutionary theory is generally accepted now, and although the Darwinian theory is the most commonly held, it is necessary to remember that new schools of thought are reverting to the Lamarckian theory, which explained evolution biologically in terms of environment and use and disuse, and departs from the generally accepted view by maintaining that variation due to changed functions or environment are always transmitted. This school is known in America as the 'Neo-Lamarckian' school. Another school is laying down the hypothesis that variation is definite, and that evolution exists in order to maintain the species adequately along reproductive and social lines; and this school, of course, breaks down the theory of variation along the lines of the struggle for existence of the individual, replacing it by a struggle of the species. This, of course, explains evolution in terms of co-operation instead of competition, and if applied, as the Darwinian theory has been, to other fields of thought, it would once again completely alter the outlook on life. From all this it will be seen that the science is by no means complete, or its findings unanimous in any one direction, and that it all turns on a wider and more definite study of the functioning of organisms. This in its turn can only be studied in the light of the knowledge of the organism and its parts. Thus we are led to the conclusion that the two most important branches of B. are morphology and physiology.

Morphology.—As seen in the brief historical sketch above, starting with Gesner, we arrive at the 17th century with this subscience in a very incomplete state. Ray and Willoughby then attack [illegible] and with [illegible] its greatest extension as mere general natural history. He traces out *all* that was known in the old world with accuracy in his book on natural history, and we then find Linnæus improving on this with his marvellous artificial system of classifying the anatomical world. The importance of this must again be emphasised, for it is the foundation stone of *modern classification*. This led on to the extending work of Jussieu in botany, who classified not according to external forms alone, but on the basis of comparative anatomy. With Cuvier taking up the same task in zoology, we have the foundation of the natural system of classification laid down. From this Bichat proceeded to the analysis of organs into tissues, and Schleiden and Schwann, resolving this still further into cells, from which the step to protoplasm was made by Dujardin and Van Mohl. At the same time the study of embryology, or the development of the individual, was carried out by Von Baer, along the lines laid down by Harvey, Wolff, and Robert Brown. This enables us to trace the development of an individual organism, knowing its structure and the vital processes connected with each step of that development; and it enables us to link up the history of the individual with the history of the race. If we try to resolve living matter to a less complex stage than protoplasm we pass from the realm of morphology into the realm of physics or chemistry; so that morphology must be studied in terms of either organism, organ, tissue, cell, or protoplasm.

Physiology.—Starting again with the ancients we find that their knowledge of physiology was vaguer than their knowledge of morphology, the study of medicine by Hippocrates was a study of the functioning of the organism, and the great discovery by Harvey of the circulation of the blood started the study of the physiology of organs and opened up the truth that many of the processes of life are performed by definite organs. From this Bichat developed the study to the functioning of tissue, and

Virchow further reduced the study to a consideration of the functioning of the cell. As we shall see under the heading 'Nature of Life,' physiology has to deal with the processes of growth and waste (metabolism) in the protoplasmic material of the cell; for these are the ultimate cause of life and death; and so the work of Bernard in relation to these processes of the protoplasm is seen to be of the highest importance. Thus it is evident that morphology and physiology have developed along similar lines and thus early it can be seen how interdependent, and necessary to the interpretation of each other, they are.

Embryology and evolution.—But although these are the main divs. of that aspect of B. which is concerned with the collection of facts concerning life as it acts upon matter, yet embryology, or the study of the development of the individual organism, binds these two sciences together in such a manner as to enable us to take a comprehensive outlook on organic matter. Commencing with Harvey's assertion that all living organisms develop from an ovum, it was not considered as of value until Wolff re-asserted it in the 18th century, and it was only after Von Baer had developed the subject, and Schleiden and Schwann had originated the cell theory that it was of great use. However, the linking of this subscience with that of palæontology and an observance of the fact that the history of the development of the individual more or less resembles the chronologically increasing complexity of organisms, have led to the attempt to explain and understand this development under the theory which we term evolution. It is possible to understand how embryology links up morphology and physiology, when we remember that in studying the development of the individual we must investigate the structure of the various stages in that development and the vital processes connected with that structure in those successive stages.

Nature and origin of Life.—Now it will be seen from all that has gone before, that the work of the biologist is to study the phenomena of life acting upon matter, that is, 'B. is the science which has for its object the study of organic beings, and for its end the knowledge of the laws of their organisation and activity' (Charles Robin). It is evident to all that it is no concern of the biologist, as a biologist, as to what is the nature of matter: and it should be just as evident that, in reality, it is no concern of his as to what the nature of life may be. Nevertheless, the question as to what is the origin of life has crept into the biological aspect, together with the question of the nature of life. More particularly has this gained ground through the recent statements of Professor Schäfer at the British Association meetings, 1912. He once again has revived the idea that life can be made artificially in the laboratory. But although it is not truly the biologist's province to study the nature of life, he is within the bounds of his science when he is studying the nature of living matter. It has been ascertained by using physical and chemical methods in the study of physiology, that living matter always consists of a complex compound of carbon, hydrogen, nitrogen, and oxygen (called protein), together with certain salts and about seventy per cent. of water. These are the chief components of that primary form of living matter known as protoplasm. Further, living matter is always in a state of metabolism or physico-chemical change, *i.e.* it is cons[illegible]'s material and . In this process . of growth (anabolism) or in a state of waste (katabolism). The respiration of oxygen causes carbonic acid gas and other oxidated compounds to be formed out of the waste tissues, and the result is decay. But matter is taken in to repair this waste, and the matter taken in is either protoplasmic from other living organisms, or else it consists of the same elements in simpler forms in the case of animals, while plants seem to be able to take in and build up into proteins the gases themselves (nitrogen, and carbon dioxide). In either case the addition takes place by interposition between existing molecules, not by mere accretion at the surface. If the disintegration takes place faster than the reconstruction, then the cell decays and dies; if the two processes go on at the same rate, then the size remains stationary: if the former goes on at a slower rate than the latter, then the cell grows. Now non-living matter does not exhibit these phenomena. A crystal can be made to grow if suspended in a saturated solution of matter similar in structure to itself, but there are two striking differences in this growth from the growth of living matter. In the first place, as has been stated, a crystal can only be made to grow at the expense of material the same as itself, while plants grow at the expense of materials far different from itself, and even animals absorb matter that is different from their own. Again, crystals only grow by accretion at the

surface, while the growth of living matter is always a process of intussusception between existing molecules in the cells. Now, further, all living matter decays and dies by resolving itself into highly oxidated compounds, and again, these processes of life depend upon certain ranges of moisture and heat. All living matter large enough to be studied under the microscope yields to the fact that the different parts differ chemically and physically, and that in most living things these different parts become organs visibly different, and even the simplest forms of life possess that power of responding to stimuli which is known as irritability. Again, on the ground of propagation living matter is quite distinct from non-living matter. As far as we are aware at present, all living matter proceeds from pre-existing living matter (biogenesis), a portion detaching itself and acquiring the same power of reproduction by division. Now we know of nothing in non-living matter which is in any manner similar to these properties of living matter. But although this seems to show a sharp division between living and non-living matter, it is not so simple a matter as it may seem to be at first sight to distinguish between the two. For simple forms of living matter are not very distinct from non-living matter. It may be that the adaptability of living matter to environment and functioning is the clearest method of distinguishing the living matter. But the fact remains that the difficulty to chemists in
is not its
fundamenta
tion are w
lies in the formation of these compounds direct from their elements. For although the science of organic chemistry has proceeded very far, yet to make organic compounds, in any sense approaching the complexity of protoplasm, it is necessary to proceed from less complex but still organic compounds. So biologists are not yet prepared to use chemical formulæ to explain the composition of living matter. This has all led, however, to the idea that 'life' and 'living matter' are interchangeable terms, and has given rise at various times to a type of scientist generally regarded as a biologist who is concerned with the facts of the origin of life. As the general view is that he is a biologist, the question may be considered here, although it rests really in the realms of either physico-chemistry or metaphysics. Several views have been put forward on the origin of life, and the chief one is that of biogenesis, *i.e.* that all living matter proceeds from living matter. This cannot be put forward as a law, but it rests upon the basis of experience. Anything beyond this is speculation. However, the view of early philosophers was that living matter proceeded from non-living
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to be false; but the perfection of the microscope, and the consequent discovery of animalculæ in any infusion of organic matter, caused the theory to be raised again in the 16th century, only to be destroyed by Spallanzani, Schulze, and Schwann. It was again raised in 1859, however, by Pouchet, whose arguments were destroyed by Pasteur, Cohn, and Tyndall. Bastian revived the matter in 1872, but his arguments do not bear scientific scrutiny. Russel Wallace has declared the question to be beyond human investigation, and speaks of a 'spiritual influx' of life. The theory supported by Lord Kelvin is that the germs of organisms were brought here by meteorites from other worlds, while Preyer supports the hypothesis that life, like matter and energy, are eternal, and that it is just as reasonable to suppose that non-living matter has been formed from living matter as it is to suppose the converse. Ray Lankester adopts the view that living matter has been evolved from non-living matter by chemical processes, and that the first protoplasms fed upon antecedent forms of their own evolution. This theory is the most generally accepted, because it fits in with the evolutionary theory best. It assumes that at some stage in the earth's history the conditions of temp., moisture, pressure, etc., were such as to allow of the formation of highly complex organic compounds. Some would break down immediately, while others would—perhaps by the aid of another substance—tend to reform as fast as they disintegrated. Having so commenced they might perpetuate themselves by feeding on less complex compounds. The theory of the survival of the fittest being applied here, the finest compounds from the point of view of metabolism, or growth and waste, would live on and gradually evolve into protoplasm. We do not know the steps and we know of nothing lower than protoplasm, so it is mere speculation; but this is the hypothesis which Professor Schäfer brought out in his widely discussed paper, read before the British Association. He has added this fact, however—that he considers that we are on the eve of the day when this process will

be repeated in the laboratory. All experience is against this view, however, although its agreement with evolution makes it plausible. But while it is easy to imagine these chemical processes as being possible, it still is true that they are not yet understood. Huxley, in his address to the British Association in 1870, held that biogenesis was the more rational theory, although he held that had he been a witness of the early stages of the earth's history, he would have expected to have seen the formation of protoplasm from non-living matter, and this was agreed with by Spencer, who thought that it fitted in, as has been stated above, best with the evolutionary theory. In any case, however, the facts are little further advanced to-day, and so the theory must still be, that in the light of experience, the origin of life is still a mystery—all forms proceeding as far as we can ascertain from previous forms; and all seem to agree that at present no form of life is being evolved from non-living matter by natural means. Thought of the behaviour and reasoning of higher animals, and the consequent conception of mind, leads us still further to incline towards the biogenetic theory.

Cell theory.—Before we can proceed further we must take note of one of the greatest generalisations of B., *i.e.* the cell theory, for upon this is based the whole study of evolutionary B. which depends upon embryology. Embryology only became fixed as a science when Schleiden and Schwann evolved this theory. Briefly stated, it is that all plants and animals, in fact all living matter, consists of one or more cells, which are composed of a mass of protoplasm, divided into nucleus and surrounding cell body. Growth is due either to the multiplication of these cells or to the increase in size, or to both. Reproduction consists in the division of these cells into two, and so all forms of life are produced from a single cell. Differentiation in multicellular organisms is produced by a division of labour among the cells. The activity of an organism, or its life, may be expressed as the sum of the activities or lives of the cells in that organism.

Embryology.—A brief outline of the facts of embryology which are useful as bases of generalisations follows, and is essential to a conception of B in its ultimate sense. In the first place we may say that the universal fact of death involves a necessity for reproduction and development. Since in all those forms of life which are more complex than the very simplest, the individual sooner or later dies, there must be some process of reproduction, or the species would become extinct, and very soon all living matter would revert to non-living matter. From the cell theory it has been seen that all living matter, simple or complex, starts life as a single cell. The very simplest never consist of more than one cell. These, after living for a certain period, divide into halves, each of which grows into the same shape and size as the parent cell. Each of these subdivides into two in its turn, and so on; and in these simple forms alone it is possible to say that death never occurs. Although the original cell does not continue to exist, yet its actual material exists. Therefore, it may be said to be immortal, though not everlasting. In this form of life there is no distinction between body and organs. All the functions are performed by one body, or rather cell, and though we speak of it as a simple form of life, yet physiologically speaking, it is most complex, for it has to perform all the functions of reproduction, nutrition, growth, etc., itself. Viewed from the metabolic position, however, it is easier to understand, for, as Bernard has shown, all the various functions of the living organism can be reduced to those of growth and waste. The manner in which they reproduce themselves is known as the asexual method of reproduction. A slightly higher, but in reality very little different, method of reproduction is that shown by some single cells, such as yeast, which bud off portions of themselves that eventually become separate. Another form of reproduction is that known as conjugation, in which apparently similar cells unite into one for this purpose; although even here there is no trace of sex. (*a*) *Differentiation:* The next stage of life is that in which many similar cells unite together to form a body. We thus get an organism made up of several cells (multicellular), and here we begin to see a differentiation of functions of the cells which leads to some of the cells being set apart for digestion or nutrition, some for movement, and some or reproduction. This aggregation of cells leads to the formation of tissues (cells combined together with one function in common) and eventually to the formation of organs (aggregations of similarly functioning tissues). In these higher forms of life the cell has split up into aggregates of different cells with different functions, but they have nevertheless all sprung from the same cell, and unitedly they may be termed the organism or body. (*b*) *Reproduction:* Now we have seen that in the formation of an organism, differentiation has been going on—cells

taking up certain functions and dropping the others. And it may be noted in passing that the cells are of two kinds: somatic cells (those which function for the growth of the body, *e.g.* the digestive nerve, glandular, etc.), and germ cells (those whose work it is solely to form the starting cells of a new organism, and are therefore reproductive). Now it is evident that the highest function of a cell is reproduction, and so it is relegated to that special set of cells known as the germ cells. Those cells which are derived from a female are termed ova, and those which are derived from a male are termed spermatozoa in animals and spermatozoid in plants—sperms in general. Having different functions they have developed along different lines, the ova being quiescent and stored with food for the nutrition of the embryo, while sperms are active and small with generally a whip-like tail. For reproduction an ovum and a sperm must unite into one single cell, which is then called a fertilised ovum. Sperms which do not reach an ovum die, and in all cases except those where parthenogenesis occurs, so do ova which are unfertilised. Under suitable conditions a fertilised ovum is able to divide and redivide into millions of cells. First are produced germ cells to secure the furtherance of the race in the next generation, and then the other kinds of cells are formed. All these take the shape of an embryo or young individual and gradually develop into the living organism. Those cells which are formed in the process differentiate into those required for the functioning of the organism, and are divided into classes—*germ and* somatic cells. No other cells but the germ cells, which remain embedded in the reproductive organs acquiring nutrition and shelter there until they again take their part in fertilisation, ever unite to form an organism. Of course it is possible for a body to regrow a part of itself, *e.g.* a wound healing, and a worm cut in halves regrowing the old half, etc., but no cells but the germ cells can produce an entirely new organism. Somatic cells increase directly by division. Germ cells must be fertilised. It is possible to trace back the germ cells, in some instances, through the embryonic stage to the fertilised ovum, [illegible] eismann's are inde- and that, germ cells go on for ever giving rise to new forms of life. (c) *Death:* Here we may branch off for a moment to show that this view raises the question as to whether death is an essential attribute of life. Death may occur in any one of three ways: (1) accidental death by (*a*) violence, (*b*) disease; or (2) death by decay or the preponderance of katabolism over anabolism in the physiological processes of life, or, in other words, natural death. Death can hardly be said to occur among the unicellular organisms which reproduce by division, however. So death seems to be involved when somatic cells are differentiated from germ cells. Death only occurs through the body; the germ cells pass into new generations. The processes of growth and waste (anabolism and katabolism) are not evenly poised, and so death steps in. (*a*) *Continuance of life:* This easily leads to the completion of Weismann's theory, *i.e.* that the germ plasma which has its seat in the nucleus of the cell has great powers of persistence and growth, and is used in the development of a new ovum, is not used up in the formation of the new individual, but is reserved for the formation of succeeding generations. This theory of course throws a great light on the problems of heredity and variation, as will be seen later. (*c*) *The embryo:* The embryo is seen to develop from a single cell into an ovum which, on fertilisation, becomes a ball of cells (*morula*), and finally becomes a sac of two-layered cells (gastrula). Taking a mammal's life history, we can go further than this into the development of an embryo under the differentiation of these cells. At first it acquires some of the characteristics of a worm; then of a simple backboned animal like a fish; then of a reptilian embryo; and finally it ranks with mammals, vaguely at first, and then it develops a likeness to its related forms. At certain stages it is a matter of impossibility to tell, say, the embryos of a dog, fowl, or man from each other.

Evolution.—This leads into a consideration of the biological aspect of [illegible] l paleontology, it develop- the historical evolution of the race. This is only true when we remember that it only follows the main lines of historical progress. Therefore the resemblance would be between embryos. An embryo man is like an embryo dog at certain stages—not like a dog.

The Darwi lished a scie evolution of had tried to speculate on the possibilities of the modifications of organisms, but Darwin was the first to show clearly the evidence for the assumption that biological evolution

has taken place. He has proved evolution to be an unbroken series of natural events, and that it can be accounted for by forces at work at present. Darwin and Russel Wallace together laid down the hypothesis of natural selection—or the survival of the fittest in the struggle for existence; and fitness here is measured by the capacity to succeed in the environment in which the organism happens to be placed. Here it may further be added that highness or lowness in an evolutionary series is governed by the complexity of the bodily and mental structure. Darwin asserted that the chief factors in the process of biological evolution were variation, heredity, and the struggle for existence. It is possible to modify the bodily and mental structure of plants and animals by continuously selecting and breeding from those which have the variations in the right directions. He showed that this does go on in nature, and he called it the process of natural selection. The result of the Darwinian theory in B. is that the two studies of variation and heredity received a great impulse, for while they are essential to a unified outlook on B., they had not in the past been studied a great deal, and they were among the most incomplete of the subsciences of B.

Heredity and variation.—Reverting to embryology for a while, it will be remembered that one of the generalisations of that science involved the genetic continuity of life, *i.e.* that in each development the germ plasma which the parental ovum contains is not used up in the formation of the offspring, but is reserved for the formation of the germ cells of the following generations unchanged (Weismann). Therefore, since no parents produce germ cells, but the cells have been handed down, as it were, from generation to generation, the truth of the saying that like produces like is obvious. Similarly, it is not hard to understand why an individual should resemble a remote ancestor, any more than that immediate generations should correspond. Now applying this to biological evolution, it is evident that no evolution could go on without it. For not only the similarities but all the differences in organisms are the results of summing up hereditary differences. For if we turn again to sexual reproduction, the substances containing the factors of heredity must be passed on with the cell or the nucleus of the cell; and it must be passed on by both sperm and ovum. Thus characters will appear in the offspring that will be reminiscent of both parents, though some may be latent and not appear until later generations. Older writers, such as Lamarck, supposed that changes which were induced in the body of the parents by temperature, moisture, nutrition, use and disuse, etc., were inherited. Weismann, however, proved that the inheritance of acquired characters was not a fact, *e.g.* that mutilations such as the repeated cutting off of the tails of dogs, or education, muscular or mental, have never been shown to have been transmitted. In fact the evidence seems to be towards the other side. But all organisms possess that power of life known as irritability, or the power of responding to stimuli, in fact this power is the result of inherited and environmental factors. Every variation of character is therefore partly acquired and partly inherited. All structures, organs, habits, and activities depend upon both factors. They are the result of heredity and environment. Again, there are two ways in which variation may occur. It may occur through a change in the germinal constitution of the offspring, the environment remaining constant, or it may occur through an altered environment the germinal constitution remaining constant. To the first

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first signifies an inherited, and the second an environmental variation. The former may be transmitted under any environment, the second only when the environment is the same, and even then it cannot be regarded as certain. Thus in the struggle for existence those organisms will succeed best which depend least on environment or external stimuli, *e.g.* warm-blooded mammals have that organisation which keeps the temperature of their blood at the most suitable point in all temperatures. Therefore they are not at the mercy of environment to the same extent as insects and reptiles which are unable to live actively except between certain limits of temperature. Again, some plants grow in both cold and warm regions, and have a different structure in each place. But if they be transposed they will acquire the characteristics of their new environment. The new growing tissues alter. So environment can affect organisms; but the effect is not a fixed result. It is not the modification which can be transmitted but rather the power to modify. Now nearly all organisms reproduce sexually, so that there is, in consequence, a constant crossing and mixing of strains. So new hereditary factors are brought into the zygote (fertilised ovum) by the gametes (germ cells) of both parents

The most concise and complete account of what happens in these cases is supplied by the work of Mendel (1866); although Darwin had evolved a theory of pangenesis which was to some extent broken down by Weismann, who elaborated this theory into a theory of inheritance which supposed that each variable organ and cell is represented in the germ plasma by a separate 'determinant,' composed of hypothetical 'units of life.' These were supposed to be *transmitted along the germ cells*, but the theory becomes too difficult in its higher aspects, and has the further disadvantage of resting on unproved assertions. An explanation of Mendel's results can best be given by means of an illustration. Take the cross[illegible]on and ra- tion nk flowe in- bred a seco[illegible]me quarter crimson, one half pink, and one quarter white. If the crimson or white offspring be inbred they will breed true; but the pink will never breed true, but will split up as before into one qu[illegible], one half pink, and one [illegible]. This is explained by [illegible] of the constant stocks give rise to similar gametes. On crossing we get a zygote which gives a hybrid offspring. But if the different gametes were equally divided on recrossing we should always get a perfect hybrid. The fact that we do not is explained *by assuming* the gametes segregate into one half crimson-producing and one half white-producing, which on [illegible] give rise to

this theory on heredity and variation may be summed up by saying that no character appears in an individual which has not been transmitted to it. The conclusion is that the total inheritance transmitted in a gamete is made up of factors which contribute to the development of similar characters. These characters may be developed by interaction with other hereditary and environmental characters. The origin of all the domestic races of animals and plants is accounted for by the hypothesis that the various hereditary factors have been split up among a number of races, each losing some factor or factors. We can reproduce the colour of the wild rabbit by crossing a yellow and a Himalayan variety, so that we can perform the reverse feat of bringing together again in the segregated hereditary factors. Therefore the theory seems to be sound. It is impossible to say what these factors are, but they are not [illegible] matter, as was [illegible] Weismann. They may be definite chemical compounds, which enter into the metabolising compounds of the cell, and so influence the metabolism in various ways. Mutations are said to arise spontaneously—this being another way of stating that nothing is known of their cause. The Darwinian theory is that great and sudden changes in environment increase the variability; and this was more or less proved by Tower, who on subjecting beetles, at certain stages, to heat and dryness for a certain time, found that the offspring differed considerably from the parents, and were constant stocks, for on crossing with the parent stock they gave rise to hybrids in Mendelian ratios. The question has further arisen as to whether the differences in offspring of the same parents are due to environmental action on the embryo, or whether they arise in the *germ cells*. Most differences are probably germinal in origin. The further fact that the germ plasma is highly resistant to variation must not be lost sight of, for, but for this quality, all species would eventually cease to exist. Germ plasma can, of course, be damaged or weakened—chiefly by injury.

Struggle for existence and natural selection.—This is the least controversial of the primary factors of biological evolution, and once stated and understood, the truth is bound to be recognised. It expresses the fact that more organisms are born into the world than can survive. Darwin recognised that the truth of this universal struggle for life accounted for *the whole of the facts of the economy* of nature, together with all the facts of distribution, rarity, abundance, extinction, and variation. Organisms tend to increase in geometric ratio, so that their powers of increase are enormous. Russel Wallace shows that a single pair of flies produced twenty thousand larvæ which will hatch into flies in a fortnight or so capable of hatching in their turn two hundred million larvæ. So this is a crowded world, with each organism tending to increase, and the increase being only possible at the expense of some other

[illegible] enormous possibilities of increase we need only refer to the results when circumstances, such as the intervention of man or climate, have released those energies, *e.g.* the growth of the rabbit pest in Australia, epidemics of

disease, or locust swarms. The greatest struggle is between members of the same species. Struggle for existence, natural selection, and adaptation are very intimately connected. The struggle being the first cause, produces selection, which is only of avail in the light of the truths of heredity. Natural selection may be viewed as either a selection of the fit or an elimination of the unfit. The power of selection is shown, as in the case of the decrease of aborigines, by the rapid spread of infectious diseases transferred by a race, habituated to it, to a race which has not been previously subject to it. Unless the race happens to be adapted to resist the new disease, it quickly dies out. Further, the protective colouration of plants is a variation, which although not adaptive, does act selectively in the struggle for existence.

Isolation and sexual selection.—Still further, in the Darwinian theory of the struggle for existence we find the fact of isolation entering in. Selection without isolation might lead to evolution along a straight line, but with it [illegible] divergent isolations. [illegible] es of isolation we may name geographical, physiological, and adoption of different modes of life. The first form is shown in seeds and microscopic animals which are borne by wind, water, or their own movement into new and different surroundings. Land organisms get separated by islands, mountains, or deserts, and marine organisms by land between seas or rivers. But if geographical isolation does arise, then the type begins to vary through the action of the different environment. Physiological isolation may arise from different habits or temperaments or from sterility. As an example of the first, we may take the fact that the whites and negroes in America mingle with practically negligible production of crossed organisms. Sterility is the most important physiological barrier, and sometimes intercrossing and self-fertilisation are prevented by the sperm and ova developing at different times of the year. True sterility would be shown in those cases where no fertilisation is possible, or if possible then only imperfectly, resulting in a sterile offspring. In the higher organisms, the struggle of the male sex for the female, which only takes place among the higher vertebrates and anthropods, induces sexual selection. The superiority in strength and fighting weapons of the male sex is accounted for by variations surviving which can give victory in this struggle to their owners. The ornamental developments of the male sex, *e.g.* peacock's tail, etc., are not so easy to understand, but they are generally accepted as being due to the same effort to attract the female, and so secure propagation of the species.

Phylogeny.—One more subscience needs now to be added. If the evolutionary theory be adopted in B., then, turning this theory back to the study of embryology, morphology, and palæontology, we should be able to make out the affinities between adult organisms and discover lines of descent connecting the various branches of the genealogical tree. This leads to the study of phylogeny—the history of organisms showing their relationships. This study leads to two interesting facts, *e.g.* degeneration and convergence. Forms which differ widely in their adult forms are found to be closely allied in their young or embryonic stages. Fishes in caves lose their eyes, parasites lose their locomotive organs, and so degeneration is a phenomenon which must be noted by the biologist. It is a return along the pathway from the complex to the simple. Now this is put forward as a support of the evolutionary theory; for in the view of evolutionists, variation can be either progressive or retrogressive, and according to the need of the organism at the time, so does retrogression or progression take place. All along the evolutionary path are strewn derelict organs, once required, now of no use, or of no consequence in the struggle for existence. These organs are called vestigial and tend to disappear. More often, however, a vestigial organ is adapted to some new function. As a rule, evolution leads to a specialisation and divergence along the phylogenetic tree, but it sometimes happens that we get convergence in structure or function.

Place of biology among the sciences.—By this time it is evident that B. considers all matters which throw light on the action of life on matter. It is further plainly to be seen that it borders on the verges of the realms of, and is closely related in its higher stages to, both the physical and mental sciences. A study of morphology or physiology in the light of the cell theory leads one down to the protoplasm, and it is the constant endeavour of a certain type of biologist to reduce this to chemical and physical formulæ. He has not yet succeeded, but as is evident from recent scientific meetings, it is regarded as being extremely possible. Further, Mendelism can only be worked out by the aid of mathematics; and the study of evolution or embryology is incomplete unless

it is accompanied by some knowledge of palæontology, which is a geological science. Further, since B. in its widest sense deals with the phenomena of life, there is no sharp distinction between it, psychology, and sociology. Psychology, if not dependent upon physiology, exhibits phenomena which are comparable with physiological facts, and the observed social relationships of animals, which at any rate form a part of B., bear a curious analogy to human institutions. So there is a definite parallelism between these three sciences. *For although mental states* are always preceded by mental states, they can also be expressed in terms of feature, gesture, voice, etc.; and, on the other hand, the doctor constantly ascertains the state of the organism by inquiring into feelings, and verifies these by a chemical and physical diagnosis. Thus a school has arisen which interprets biological and psychic states in terms of chemistry and physics. This has gained a great deal of ground, but it should be borne in mind that there is also a school of philosophy which interprets everything material in terms of mind, and as far as matters are developed at present, both views are equally correct, *i.e.* neither is capable of verification. Taking as an illustration the function of digestion, we may work it out in this way. We can correlate this process with psychic states of hunger and satisfaction, and we can further reproduce the *process in a test tube in the laboratory* and outside the organism by means of physico-chemistry. Therefore we may say that we can define the process of digestion in terms of chemistry and physics, or in terms of psychology.

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while the psychologist is concerned with the mental [illegible] that functioning concerned with [illegible] tion. So neither the physiological nor the psychological aspect can be stated in terms of physico-chemistry. Therefore the three branches of science—mental, physical, biological—are distinct although parallel. Again, although the science of sociology is a problem *of social aggregates and* the study of the individual furnishes valuable data in the study of the race, yet its final generalisations are in terms of race and not in terms of social units. So once again the parallelism is evident although the reduction to physical science is unthinkable.

Practical value of biology. — Although B. finds its highest expression in a contemplation of, and effort to comprehend, the world of life and our place in it, it touches in various ways upon practical life, and has proved efficacious in many directions. The doctrines of the struggle for existence and natural selection lead naturally to the science of selective breeding which Darwin made such good use of. Then again the study of medicine, and the demand for new drugs, reacted on botany and induced the cultivation of useful herbs. Further, the idea of natural selection or the survival of the fittest has illuminated the science of sociology, *which after all depends a great deal* upon natural history. It has caused a new view to be taken of the study of mankind, and a careful sympathetic view is now characteristic of both anthropology and comparative religion. Again, the *Mendelian theory* has established the relations for eye colour and certain diseases and malformations. Now we can tell the probable result of marriages between afflicted persons, and can determine the proportion of their children likely to show these special characteristics. B. concerns itself with those micro-organisms which act so powerfully, for the good or evil of mankind. Pasteur developed the study to the knowledge of the microbes of chicken-cholera, and silkworm disease, and now by inoculation experiments we have learned how to guard against some of the most deadly of these microscopic organisms. To this knowledge we can trace most of our modern *improvements in sanitation and hygiene*. Malarial fever was once quite common in the fen districts, but it was stamped out by drainage and quinine before the fact was discovered that it is spread by germs, which are transferred from mosquitoes which feed on the blood of infected persons, and that the parasites increase in size and fill the body of their insect host (Ross and Manson). By means of the bite of one of these the cycle is started once again. From this many branches of preventive medicine have been evolved, *e.g.* Maltese fever is found to originate in goats, and is transferred to milk and cheese. Lord Lister applied this knowledge to surgery, and his discovery of antiseptics, together with anæsthetics, made possible the great surgical advances of recent days. The last method in which B. is applied to life is as yet only in its observation or research stages. This use is in the study of the science of eugenics. This is the science which intends to perpetuate the qualities, inherent or hereditary, that contribute to the ideal development of the human race. It is thought by some that the ad-

vancement of preventive medicine and hygiene has resulted in a perpetuation of variations of human life which would have died out otherwise. Mental and physical defects are preserved and perpetuated in the offspring, and this is only possible by this advancement in the health conditions of life. To preserve the race it is thought that the theories of heredity, variation, selection, regression, etc., must be studied in relation to the individual. Great work in the foundation of this science was done by Sir F. Galton. There seem to be two schools of thought in the subject, both of which agree in postulating that the unfit (mentally and physically) should not be allowed facilities to reproduce their kind. One school aims at attaining this by segregation of these individuals into separate communities, and so preventing reproduction; while the other school is more drastic and proposes some form of sterilisation. As a science it is as yet in its infancy; as a science with public opinion behind it, it is untried; and so for all practical purposes it may as yet be merely summed up as a specialisation of the Darwinian and Mendelian theories with regard to human beings.

Conclusion.—Thus it will be seen that in neither of its two aspects is B. complete, although it is in a sufficient state of completeness to rank as a most valuable study for the purposes of humanity.

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Bion, a Greek poet, of whose life no record is known to exist. He was born at Smyrna, or near by, and he lived about 100 B.C., probably in Sicily or Magna Grecia. His poems belong to what is termed the bucolic class. A few only have been preserved, and among them his *Lament for Adonis* is the best known. The subjects treated by him were generally the passions of the gods. B.'s poems are usually included with those of Theocritus. Hermann's and Ziegler's separate editions are the best. A. Lang translated most of B.'s poems. In 1795 C. F. W. Jacobs pub. his works at Gotha, and in the same year they were pub. in London by Gilbert Wakefield. In 1807 they appeared at Leipzig. According to the legend, B. died of poison. An elegy was written by his friend Moschus on the event.

Bion, a Greek scientist, belonged to the family of Democritus. He lived at Abdera, and was famous as a mathematician. It was said that he taught the existence of countries where the year is composed of a day and a night.

Bion of Borysthenes (*c.* 275–*c.*241 B.C.), a Gk. philosopher. He studied at Athens under Crates of the Cynic school, and Theodorus the atheist. He then began his writings, of which a few fragments merely have descended to us. Hence it is practically unknown what opinions he held. He was in his time considered to be an atheist. He died at Chalcis in Eubœa.

Biondi, Giovanni Francesco (1572-1644), an Italian writer, *b.* in Liesena, one of the Dalmatian Islands. James I. was acquainted with him, and his knighthood was won by the successful execution of a secret mission to the Duke of Savoy. He wrote a *History of the Wars of the Roses* in Italian, and died in Berne, leaving a fame based upon the elegance of his prose.

Bionomics, or 'laws of life,' that branch of biological research which deals with the relations of organisms amongst themselves and to their environment. It thus includes the study of Heredity (*q.v.*), or the tendency of growing organisms to develop a symmetrical arrangement of parts which is characteristic of the species. How this tendency is transmitted is an old and still unsolved problem, though the researches of the followers of Mendel (*q.v.*) are suggestive. The development of parental characteristics is dependent upon the maintenance of certain conditions in the earliest or pre-natal stages of growth, and these conditions are investigated and generalised in the study of Embryology (*q.v.*). Finally, the species being looked upon as one link in the whole chain of organic life, it is necessary to study how cer- [illegible] by the laws [illegible] have been [illegible]ies studied under the name of Evolution (*q.v.*).

Bioplasm, a name given to living protoplasm, but especially that which is concerned in the processes of reproduction.

Biot, Jean Baptiste (1774-1862), physicist, was born at Paris. He was educated in the polytechnic school, after which he entered the artillery service. The latter he soon left in order to study natural science and mathematics. He taught physics for some years at Beauvais, after which he became professor of the same subject in the Collège de France.

In 1803 he was elected a member of the Academy of Science, and a year later he was appointed to the Observatory of Paris. In 1806 he was made a member of the Bureau des Longitudes, and in 1809 became also professor of physical astronomy in the University of Paris. He pub. several excellent text books; among them may be mentioned *Essai de Géométrie Analytique; Traité Elémentaire de Physique Expérimentale*, etc. He also wrote books on the astronomy of the ancient Egyptians, Chinese, and Indians, all of which works were widely known. Nearly all branches of physics were considerably advanced by his labours, for his whole life was passed in study and teaching. He was one of the most eminent physicists and mathematicians of his time. He died at Paris.

Biotite, an important member of the Mica group of minerals. It is a silicate of aluminium and iron with magnesium and potassium. It crystalises into hexagonal prisms. It is often called magnesia mica, as distinct from muscovite or potash mica. The most important variety of B. is meroxene, which is found in volcanic deposits. It was from fine crystals of this variety, found near Vesuvius, that mineralogists were able to determine the crystalline form of mica, which was formerly thought to belong to the hexagonal systems. Other rubellene, found in many volcanic rocks, voigtite, found in gravel rocks, phlogopite, which has a large proportion of silica, and lepidomelane, which is rich in ferrous and ferric oxides. When ferrous oxide quite replaces magnesia, iron mica results. B. mica is much more readily decomposed than muscovite.

Bipinnaria (Lat. *bis*, twice, *penna*, a feather) is the name given to the larva of a starfish. Its shape is peculiar, and has [illegible] long 'arms,' which at firs gradually exte enclose nearly and lower halves of the body.

Biplane, *see* AERONAUTICS.

Biquadratic (Lat. *biquadratus*, twice squared), an equation which involves the fourth power of the unknown quantity, *e.g.* $x^4+ax^3+bx^2+cx+d=0$, where x is unknown.

Bir (Arabic, a well), a town in Asiatic Turkey. It is situated on the l. b. of the Euphrates at its nearest approach to the Bay of Iskanderun. It is about 80 m. N.E. of Aleppo, on the main route from Aleppo to Orfa and the Persian frontier. It had formerly a considerable trade with Bagdad by river. Pop. 9000.

Birbhum, a district in Bardwan or Burdwan, Bengal, India, with an area of 1752 sq. m. The chief agric. product is rice.

Birch, a tree or shrub belonging to the genus of Betulaceæ. There are about twenty-five species of B., and while the majority are trees of medium size, there are some mere shrubs among the number. B. trees are to be found in nearly every country of the N. temperate regions, and in the arctic. The trunks are round with slim branches, and the bark is generally in fine, soft, membranous layers.

The Common B. is exceedingly graceful and beautiful, and silvery white. It grows quickly, but does not live long. It is found abundantly in the forests throughout the greater part of Europe, and also in Asia Minor and northern America. It is particularly common in the forests of Russia, where it is of the greatest possible value. It is used for charcoal and for firewood. It is manufactured into furniture, used for upholstery and for carriage building. Thousands of spoons, greatly used in Russia, are made from it. The bark and also the leaves are utilised medicinally, and for dyeing and tanning; the Russian leather is noticeable for the odour caused by the B. tanning. In N. America the B. tree is as useful. The wood is tough and durable, is made into canoes, snow shoes, [illegible]sters, and also used for house roofing. There are several kinds of B. in N. America: the white is used in the last-mentioned ways. The 'black' B., another variety, is sometimes called the 'red B.,' and is exceptionally hard, hence it is very valuable. The leaves are frequently used for making tea, which has an agreeable flavour. The 'yellow B.' of Nova Scotia is another species, and the 'paper' B. is so called because it can be thinly peeled into sheets and used in the place of paper. B. oil is manufactured from the outer layers of the bark, and mixed with a fine meal it forms food for pigs. In early spring, when the sap is just beginning to rise, it is drawn from the trunk, and on account of its sugary nature is manufactured into a kind of vinegar. The 'dwarf' B., a very low shrub, is found almost everywhere in the northern part of the world. The Lapianders use it in stuffing their beds, for fuel, and the seeds for food.

Birch, Charles Bell (1832-93), sculptor, and son of Jonathan B., was born in London. He was a pupil at the school of design, Somerset House, and afterwards he went to Berlin with his father. He then studied at the Berlin Royal Academy. In 1852 he returned to London, and studied at

the Royal Academy, where he obtained two medals. He won £600 in 1864 from the Art Union of London by his life-size group 'A Wood Nymph.' He exhibited at Burlington House. He became an A.R.A. in 1880, and in that year his work of the Griffin, on the Temple Bar memorial in Fleet Street, was accomplished.

Birch, Jonathan (1783-1847), the translator of *Faust*, was born in London. From 1798 until 1812 he worked in the city and travelled in Russia, Denmark, and Sweden, during which time he had the friendship of the Crown Prince of Prussia. In 1812 he returned to London and took up literary work. In 1841 he was made a foreign honorary member of the Literary Society of Berlin. In 1846 he had a home offered him in the King of Prussia's palace. His works are chiefly translations: *Faust*, *Banquet of the Seven Sages*, *Nibelungen Lied*, etc. He died in Prussia.

Birch, Samuel (1813-85), an antiquary and Egyptologist, was born in London. His father was the rector of a London parish. He was educated at Merchant Taylors' School, and in 1834 he was employed in the Record Office. In 1836 he entered the British Museum as an assistant in the antiquities dept. He thus acquired a great deal of [illegible]ptian antiquities; In 1861 he was [illegible]eper-ship of that branch. In 1862 he received the LL.D. degree from St. Andrews, and the same from Cambridge some ten years later. In 1874 he became president of the London Congress of Orientalists. He wrote largely, and contributed to several journals, etc.; he trans. many hieroglyphical works, and compiled Egyp- [illegible] had a keen [illegible]nguage also. [illegible] painstaking man, and extremely laborious in his studies.

Birch, Samuel (1757-1841), an English dramatist, was born in London. He was the son of a baker at Cornhill, and was educated at a private school, after which he worked in his father's business. He married in 1778, and had thirteen children. He became a volunteer colonel, and in 1814 he was made Lord Mayor of London. In 1836 he disposed of his confectionery business, and retired from public duties. He wrote numerous musical dramas and poems, including *The Adopted Child*, *The Smugglers*, *The Manners*, *Fast Asleep*, *A Victim of Romance*, etc., etc. His plays were performed at Covent Garden, Drury Lane, and Haymarket.

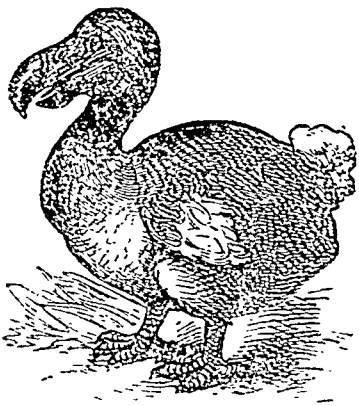
Birch, Thomas (1705-66), an historical writer, was born of Quaker parents in London. He was unfortunately denied a university education. He, however, qualified himself by dint of great perseverance, and application to study, for the ministry, and entered the Church of England. His ordination took place in 1730. In 1734 he became chaplain to the Earl of Kilmarnock, and after this he had many changes. In 1735 he became a member of the Society of Antiquaries. He took his degrees in 1752 and 1753—M.A. and D.D. He did a considerable amount of literary work, compiling and editing. He also transcribed a great number of works in the library at Lambeth Palace. He died from the effects of a fall from his horse.

Birch, Walter de Gray, Eng. archæologist. He was born in Jan. 1842, and was the son of Dr. Birch, the Egyptologist. He was educated at Charterhouse and Trinity College, Cambridge. In 1864 he entered the MSS. dept. of the British Museum. His productions include *The Commentaries of Alfonso d'Albuquerque* and *The Cartularium Saxonicum*. For twenty-two years he ed. the British Archæological Association's *Journal*, and has issued many treatises on subjects dealing with archæology and ancient history.

Birch-Pfeiffer, Charlotte (1800-68), was an actress and dramatist of Ger. origin, who was born at Stuttgart. As soon as she was thirteen years of age she began her public life at Munich, and from that time she played at Berlin, Hamburg, and sev. other places. She was very successful in her acting. She was married when she was twenty-five to a Dr. Birch of Copenhagen. She played afterwards in Amsterdam, St. Petersburg, and Pesth. Later on, she became sole manageress of the Zurich theatre, and then she took to writing plays and dramas. She won more popularity for her play writing than for her acting, though her works reached no very high standard. They are still favoured in Germany. She dramatised *Jane Eyre*, and her works received publication in twenty-four vols. at Leipzig. In 1844 she accepted an engagement at the Theatre Royal, Berlin, where she stayed for the rest of her life.

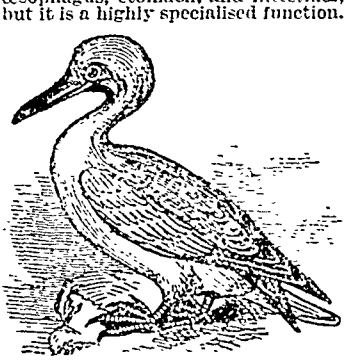
Bird. According to the definition of Dr. Gadow, birds are 'oviparous, warm-blooded, amniotic Vertebrates, which have their anterior extremities transformed into wings. Metacarpus and fingers carrying feathers or quills. With an intertarsal joint. Not more than four toes, of which the first is a hallux.' This transformation of the fore-limbs of Bs. into feathered wings is of the greatest importance, and the modifications of the internal structure

arising from it form the basis of classification of this group of animals known as *Aves*. The wing consists of the typical parts of a fore-limb, the humerus, radius, and ulna, carpus, metacarpus, and digits. The first digit is the *pollex*, or thumb, to which some feathers, known as *alula spuria*, or bastard wing, are attached; the second digit is the *index*, which bears



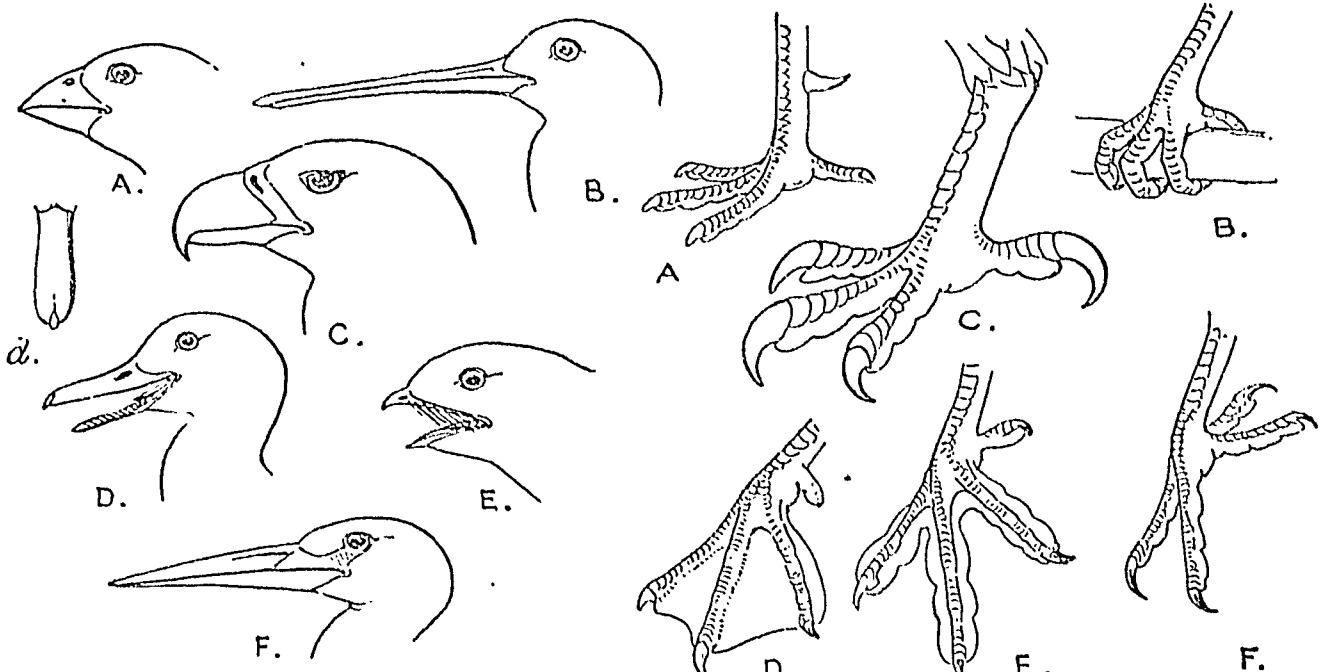
DODO

the large feathers known as the *primaries* or *manuals*, usually ten in number. The primary feathers with the *secondaries* or *cubitals*, which are attached to the ulna, form the large wing-quills, called *remiges*, which are used in flight. The sternum, or breast-bone of Bs., is affected by their powers of flight, bearing a projecting carina, or keel, when the power is present for the attachment of the great pectoral muscles. When the Bs. are incapable of flight the keel is absent or greatly reduced. The vertebral column is completed in the caudal region by a flat plate known as the pygostyle, which forms a support for the rectrices, or steering tail-feathers, and for the uropygial gland. The legs are composed of a femur, tibia, and fibula, and the bones of the foot; the feet have often four toes, but in many cases there are only three. In swimming-birds the legs are placed well back, while in those which have an upright carriage the balance of the body is preserved by the forward position of the legs. The feet are known as *pedes radantes*, or wading feet, and *pedes gradarii*, or walking feet, according to their function, and the latter are much more completely feathered than the former. No existing species of Bs. possess teeth. The uropygial borne on the pygostyle is an oil-gland used by Bs. in which it is present when preening their feathers, for their skin is unprovided with sebaceous glands. The eyes are furnished not only with an upper and a lower eye-lid, but also with a nictitating membrane, semi-transparent, and covering the eye at the volition of the owner. The vascular system of *Aves* contains warm blood, which is kept usually at a higher temperature than that of mammals; death from cold is a rare occurrence unless allied with torpidity and starvation. The respiratory system is extremely curious, as the lungs themselves are very small and are prolonged into air-sacs with which are connected a number of air-spaces in the bones. These air-spaces are found in the species which are powerful flyers and require the lessening of bodily weight, but in young Bs., small Bs., aquatic and terrestrial Bs. they are either absent or negligible. The organ of voice is not the larynx, but usually the *syrinx*, a peculiarity of this class formed at the bifurcation of the trachea, and the modulations are effected by adjoining muscles. The heart of a B. is enclosed by pericardium, and consists of a right and a left half; there is no diaphragm between the thoracic and abdominal regions. Digestion takes place in the œsophagus, stomach, and intestines, but it is a highly specialised function.



GANNET

The tongue is the first organ to aid in digestion, then comes the œsophagus, and this has frequently a dilatation known as the *crop* in which the food is softened; the food then passes into the stomach, in the front part of which, the *proventriculus*, the process is carried out further, then follows the gizzard, or *ventriculus*, which contains small stones and gritty matter

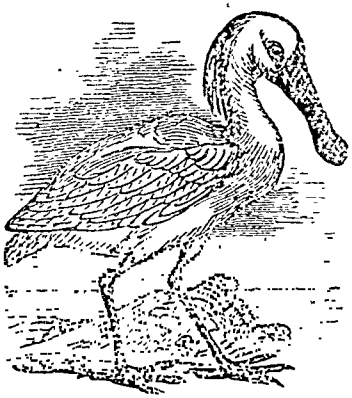


SOME TYPICAL HEADS AND FEET OF BIRDS

A, Seed-eating bird. B, Searches for food in soft mud. C, Eagle. D, *d*, Duck. E, Bird with wide gape which catches insects on wing, *i.e.* Swallow, Nightjar. F, Heron.

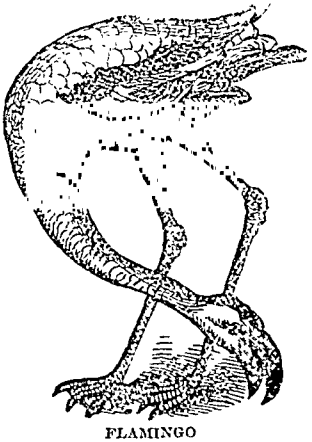
A, Bird that passes much of its life on the ground, *i.e.* Fowl. B, Percher. C, Hawk, Eagle. D, Duck. E, Coot. F, Woodpecker.

for the grinding of the food ... noticeable in suc ... and grain. The ... nest and hatchi ... be definitely assigned to either the



EUROPEAN SPOONBILL

male or the female B. It is customary for the male to provide the material and for his partner to perform the architectural work, but in many cases the female provides her own material. It usually falls to her lot also to do the sitting, but there are cases in which the pair takes this in turn, and

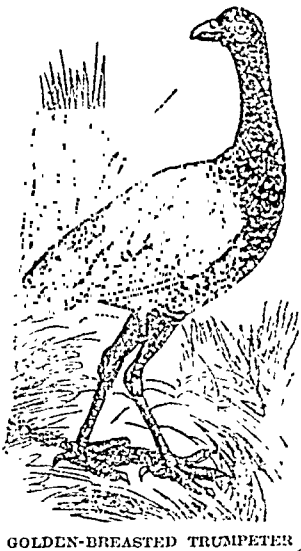


FLAMINGO

other cases in which it is performed by the male alone. The cuckoo neither builds a nest nor rears its own young, but places the eggs in the nest of another bird and leaves the foster-mother to care for them. The position which *Aves* hold in the animal kingdom is higher than that of *Reptilia*, and lower than that of *Mammalia*; with the former class they have great



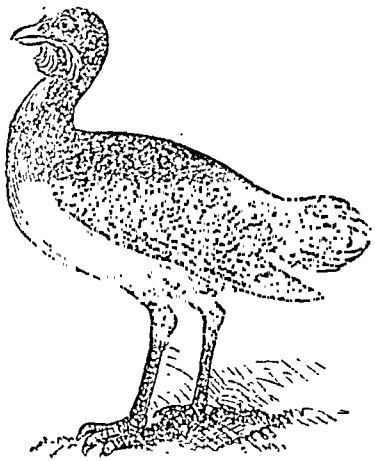
GOLDEN PHEASANT



GOLDEN-BREASTED TRUMPETER

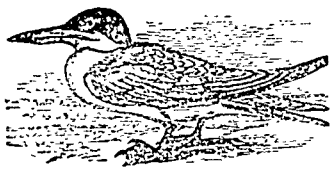
affinity, but no links have been d ... covered to trace the transition fr ... one to the other. The discovery of t ... oldest B. known, the fossil *Archæopteryx*, has been of great val

in such research, and Huxley has classed Bs. and reptiles together in his group of *Sauropsida*. There is a resemblance in the generative organs and oviparous condition of both classes, but Bs. are never viviparous. The scales of reptiles may be compared with the feathers of Bs., but



GREAT BUSTARD

the blood of the *Reptilia* is cold while the blood of *Aves* is warm. In the development of brain, memory, and sight the lower class compares unfavourably with the higher, but the chief difference between the two lies in the adaptation of the B.'s forelimbs to flight. This adaptation, as well as a keeled sternum, is to be found in the reptilian *Pterodactyl*, but in the absence of feathers and in the general structure of the skeleton this fossil differs greatly from a B. Among



TERN

mammals the bat is also able to fly, but the specialised structures by which it accomplishes this feat is entirely different from those found in *Aves*.

In the classification of Bs. zoologists are agreed in dividing them into two unequal orders, the *Archæornithes*, or primitive Bs., which includes the simple genus *Archæopteryx*; and *Neornithes*, or modern Bs., which is several times subdivided, at first into three sub-orders known as *Ratitæ*, *Odontolcæ*, and *Carinatæ*.



PUFFIN

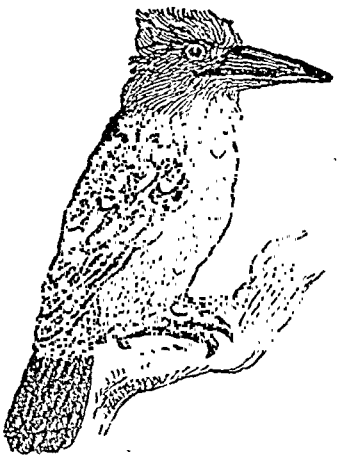
The *Ratitæ* receive their name from the resemblance of their breastbone to a flat-bottomed boat; they are flightless Bs. with reduced wings, and include, in addition to extinct species, *e.g.* the moa, living Bs. such as the ostrich, rhea, cassowary, emeu, and kiwi, or apteryx. The *Odontolcæ* are extinct marine flightless Bs. with



TOURACO

teeth in grooves in the jaws and no keeled breastbone: an example is the genus *Hesperornis*. The *Carinatæ* is much the largest sub-order of Bs., comprising thousands of species. It receives its name from the resem-

blance of the sternum to a keel, but in several flightless forms, as the extinct dodo and the living parrot—genus *Stringops*, this keel is absent or greatly reduced. The subdivisions of



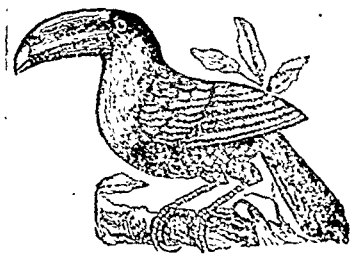
GIGANTIC KINGFISHER

Carinatæ are by most zoologists based on the system of Dr. Gadow, and are fourteen in number. The first of these, the Ichthyornithes, or fish- and bird-like tribe, consisted of toothed species of powerful flight which are now extinct. The tribe of Colymbiformes, or swimmers, consists of divers and grebes, all of which



HOOPOE

are water-Bs. with webbed or lobed feet, upright bodies, and short tail-feathers. The Sphenisciformes, or penguins, are flightless marine Bs. covered with feathers, having the wings without large quill-feathers and using them as paddles when in the water. The Procellariiformes, or petrels, are marine Bs. with webbed feet and capable of powerful flight; the albatross and Mother Carey's chicken belong to this group. The Ciconiiformes, or stork-like Bs., have feet adapted for wading, and inhabit



TOUCAN

marshes as well as the sea and inland ponds, *e.g.* the gannet, tropic-B., cormorant, heron, bittern, stork, ibis, spoonbill, and flamingo. The Anseriformes, or goose-like Bs., are aquatic and include all geese, swans, ducks, and screamers. The Falconiformes are Bs. of prey with strongly-clawed toes and curved beaks, as the hawk, vulture, eagle, kite, buzzard, falcon, and osprey. The Tinamiformes, or tinamous, is a small tribe of earth-Bs., strong and swift in flight. The Galliformes, or fowl-like Bs., are those which run along the ground or perch on trees, *e.g.* the brush turkey, curassow, peacock, pheasant, domestic fowl, turkey, grouse, partridge, and quail. The Gruiformes, or crane-like Bs., include the water-hen, rail coot, trumpeter, and bustard. Four groups are placed in the Charadriiformes, or plover-like Bs., which vary greatly in habit; some can both fly and wade, as the plover, oyster-catcher, avocet, curlew, and snipe; some can swim as well as fly, *e.g.* the gull, tern, auk, and puffin; others, as the sand-grouse, inhabit deserts; while others again are land-Bs., feeding on grain and



LYRE-BIRD

seeds, *e.g.* the pigeon, dove, and dodo. The Cuculiformes, or cuckoo-like Bs., are arboreal, and are represented by the touraco in one group, and by the parrot in the other. Representatives of the arboreal Coraciiformes, or raven-like Bs., are the kingfisher, hoopoe, owl, goat-sucker, swift, mouse-bird, quesal, toucan, and woodpecker. The last, and largest, tribe is that of the Passeriformes, or sparrow-like Bs., all of which are perchers and have few variations of internal structure. To them belong the broadbill, cock of the rock, lyre-B., bush-shrike, lark, wagtail, flycatcher, thrush, wren, swallow, butcher-B., tit, B. of paradise, rook, starling, weaver-B., American oriole, crossbill, and finch.



CROSSBILL

See A. Newton's *Dictionary of Birds*, 1893-96; A. H. Evans' *Birds*, 1899; T. H. Huxley's *On the Classification of Birds*, 1867 and 1868; C. L. Nitzsch's *System der Pterylographie*, 1840; L. Stejneger's *Birds*, 1885; H. Seebohm's *History of British Birds*, 1883-85.

Bird of Paradise, a name applied to the various members of the family Paradiseidæ, which are natives of Australia and the Malay Archipelago. They are closely related to Corvidæ, or crow family, and Sturnidæ, or starlings, but though the females are inconspicuous in appearance, the plumage of the males is very gorgeous and varied in colour. They are smallish birds, extremely active and have compressed beaks, large toes, and strong feet. Their food consists chiefly of fruits, seeds, and the honey taken from flowers, but it may also include insects and small animals, such as worms. The bower-birds [illegible] to this family, [illegible] r constructive [illegible] pecies of the Paradiseidæ are *Paradisea apoda* of Linnæus, the great bird of paradise, about 18 in. in length, the males having brilliant plumes of great length springing from beneath their wings; *Cincinnurus regius*, king bird of paradise, a native of New Guinea, which has scarlet and green plumage; *Ptilorhis paradisea*, black rifleman of N. Australia; *Diphyllodes magnifica*, magnificent bird of paradise; *Pteridophora alberti*, common to New Guinea. *See* A. R. Wallace's *Malay Archipelago*, 1890.

Bird, Edward (1772-1819), English painter of genre, was born at Wolverhampton, where for some years he was engaged in designing for japanware. When his apprenticeship was over, he resolved to become a painter, and supported himself as a drawing-master at Bristol. In 1809 his 'Good News' was accepted by the Academy, and his reputation became established. He soon came under the patronage of Princess Charlotte, and in 1815 he was elected R.A. Well-known paintings of his are: 'The Country Auction,' 'Village Politicians,' 'Blacksmith's Shop,' 'The Field of Chevy Chase.' His last historical piece, 'The Embarkation of Louis XVIII. for France,' was left unfinished.

Bird, Golding (1814-54), physician, was born in Norfolk, and educated privately. He entered Guy's Hospital as a medical student in 1832, and in 1838 he took the M.D. at St. Andrews. He became lecturer on natural philosophy at Guy's in 1836, and later on lectured on medical botany, etc. He married in 1842. His works include *Pathology and Therapeutical Indications*, *The Elements of Natural Philosophy*, etc. He died at Tunbridge Wells in 1854.

Bird, John (c. 1709-76), a mathe- [illegible] and mecha- [illegible] published a [illegible] *of dividing Astronomical Instruments.*

Bird, Robert Montgomery, M.D. (1804–54), an author, was born at Newcastle, Delaware, America. He studied for the medical profession, and practised for about a year; but preferring literature, he soon left his profession and became an author. He wrote two or three very successful tragedy plays. *The Gladiator*, *The Broker of Bogota*, and *Oraloosa* made him famous. His books, too, were very popular; among them were *Calavor*, pub. in 1834, also *A Mexican Romance* in the same year, *The Infidel* in 1835, *Nick of the Woods* in 1837. He died at Philadelphia.

Bird, William, *see* Byrd, William.

Bird-catching Spider is a large hairy spider found in many hot countries. It belongs to the genus Mygale. When stretched out, it takes up a space from six to nine in. across, although the body is only about two in. It lives in trees, or in hollows under rocks, and there it spins its curiously shaped web or nest. It goes

out at night to hunt for its food of insects and, as is stated, to ensnare young birds. It has been said that the webs are strong enough to make travelling difficult in the forests.

Bird Cherry is a tree which grows wild among the damp places in woods. It is a native of the temperate regions of Asia and Europe, being frequently found in Britain. The Scottish name for it is the 'Hagberry,' which means 'wood berry.' It belongs to the same genus as the ordinary cherry and the plum, but unlike the wild cherry, the flowers bloom after the leaves have fully appeared in early May. The fruits are black and very small, being, in fact, no bigger than peas. They are very bitter in taste, and are really only fit for birds' food. They are, however, sometimes used for colouring brandy and wine. The wood of the tree is utilised by cabinetmakers.

Bird Lice, or Mallophaga, is the name given to a family of insects or parasites which affect birds. These parasites are shaped like lice, but they are not blood sucking creatures, since their mouths are formed for biting. Their bodies are ringed round the thorax. They feed upon the skin of the birds and eat the feathers and sometimes the blood too. It is found that they commonly affect the fowls of the farmyard, and if they are not destroyed they cause considerable discomfort and unpleasantness. Not only do these lice infect birds, but they will sometimes be discovered in animals. Where fowls are kept near cats or dogs, the latter are very likely to be affected also by these pests, which feed on the hair and fur. It seems, however, that the trouble is lessened, for the lice do not appear to multiply quite so quickly on the mammals.

Bird Lime is a sticky substance obtained in various ways. It is got from the bark of the holly tree, and from mistletoe, and boiled with water. It is also prepared from flour; the starch is washed out of the flour, and the gluten left is used for B. L. The substance is frequently utilised for ensnaring birds.

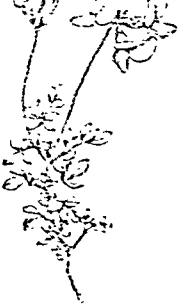
Bird-Pepper, *see* CAPSICUM.

Bird's-eye Limestone is a limestone found in the Trentin group of N. America. It obtains its name from the white cross sections that appear in the stone.

Bird's-eye View, *term used to describe* drawings made in a manner of perspective where the eye is supposed to look down from above on to the land illustrated. The difficulty naturally is to show the relative vertical heights accurately so as to give a correct impression.

Bird's Foot (*Ornithopus perpusillus*), a small wild plant belonging to the order Leguminosæ. Its name is derived from its pod clusters resembling the foot of a bird. The common plant grows in sandy soil, and is sometimes cultivated on the continent as food for sheep. The Trefoil has clover-shaped leaves, and grows in pasture, on banks, and by the wayside.

Bird's Foot Trefoil, or *Lotus corniculatus*, is a species of Leguminosæ which is very common in British meadows, and is noted for its beaked carina or keel and nearly straight legume. It affords good pasturage, and received its name from the resemblance of a group of pods to a bird's foot.



BIRD'S FOOT TREFOIL

Biretta is a cap which is worn by Roman Catholic priests. Its shape is square, with edges standing up. The cap of a bishop is purple, while that of an ordinary priest is black.

Birgus, the generic name of some decapod crustaceans of the family Cenobitidæ which are chiefly terrestrial. They are hermit-crabs, dwelling in a hole by day, and coming forth at night to seek for food, which consists largely of the fruit of the cocoa-nut tree. *B. latro*, the robber-crab or [illegible] which [illegible]m. [illegible] Kho- [illegible] N [illegible] from Kerman, and 240 m. S. from Mished.

Birkbeck, George (1786-1841), an Eng. doctor, who was born at Settle in Yorkshire, and who distinguished himself as a philanthropist. He showed at an early age the attraction which science had for him, and in 1799 he became a doctor. He practised first at Leeds and then in Edinburgh, later accepting the chair of Natural Philosophy at Glasgow. He later came to London where he took up the work he had already begun at Glasgow and showed great interest in the working classes. He helped very largely to form the Mechanics' Institute of which he was the first president. Later the name of the institute was changed to B. College. He died in London.

Birkbeck College is a recognised institution of the university of London which provides full courses for

various internal degrees for students of both sexes. It was founded by Dr. George Birkbeck, with the assistance of Bentham, Brougham, and Cobbett, as the London Mechanics' Institute in 1823. The original idea of the founders was to instruct [illegible] trades, e a great In 1884 Bream's

Birkdale, a tn. in the S.W. of Lancashire, England, situated on the coast. It is a suburb of Southport, and is about one mile distant.

Birkebeiner, the name of a political party which existed in Norway in the 12th and 13th centuries; the name arising from the birch-bark footwear which the poverty of the members compelled them to substitute for boots. The party arose in opposition to Erling Skakke and his heir Magnus, and fought for the descendants of Sigurd Mund, *i.e.* for King Sverre and his heirs, being successful in 1218 in having Hakon Hakonsson elected King of Norway.

Birkenfeld, the name of a tn. and dist. in Germany. The dist. is a principality belonging to Oldenburg, but situated at a distance of 300 m. from that place and entirely surrounded by Prussian ter. It has also a system of gov. separate from that of Oldenburg but responsible to it. It has an area of about 195 sq. m., and is mountainous and well wooded. Its chief products are cattle, flax, hemp, and iron. Its pop. in 1900 was approximately 43,500. The tn. is the cap. of the above-named dist. and has a pop. of 2500. It is situated on the Lahn, an affluent of the Rhine, and is distant from Trier about 25 m. in an E.S.E. direction. It is the centre of the cattle trade.

Birkenhead, a co. and parl. bor. of England, situated in Cheshire at the mouth of the R. Mersey. It has an area of 3848 acres. It is a tn. of purely modern growth, having a very meagre and unextensive history previous to about the year 1820, when it was simply a tiny hamlet. It is situated in the eastern coast of the Wirral peninsula, and is served by a joint service of the L. and N.W. and G.W. railways, together with the Wirral railways. A benedictine priory of Byrkhed was founded there in the twelfth century by a Norman baron, and to this priory was granted the monopoly of ferries by Edward II. Previous to about the year 1820 it had a pop. of less than 50, and in 1822 this pop. had not risen to more than 300. It is opposite the tn. of Liverpool, and for some time the jealous rivalry of Liverpool kept it back. However, in 1843 parl. powers were obtained for the erection of a dock, which was first planned by William Laird, and which was opened in 1847. Eleven years later, this dock was handed over to the Mersey Docks and Harbour Board, a corporation created especially to control the harbourage of the Mersey. The tn. itself had also during this time grown and improved. In 1836 it received the grant of a market, and in 1861 was made a parl. bor. In 1877 it received a municipal charter which included in the town the dists. of Transmere, Claughton, Oxton, and Higher Bebington. It contains at the present time many fine buildings, including a market hall, a town hall, and a magnificent bor. hospital and art school, both of which were given to the town by Sir John Laird. The railway communications of the town with Liverpool are good, a tunnel connecting the two tns. being opened by the Prince of Wales in 1886. The town is also connected with Liverpool by its ferries, the monopoly of which was bought from the lord of the manor in 1842. B. has itself acquired a great trade, having a large export trade in coal and manufactured *articles. Its principal docks are the* Egerton, Morpeth, Morpeth Branch, and Wallasley Docks, the total area of these docks being about 160 acres, and it has about 9½ m. of quayage. Huge storage warehouses are erected along the quays. Pop. 130,832 (1911), showing an increase in the last census of 19,917.

Birkenhead, British troop-ship, wrecked *off Point Danger, Simon's* Bay, Feb. 26, 1852. The soldiers were mustered on deck and remained steadily in their ranks while the boats took off the women and children; 436 men were drowned. King William of Prussia ordered the story to be read out to each of his regiments on parade, as an example of disciplined heroism.

Birkenhead, Sir John (1616-79), secretary to Laud, was a leading spirit during the sojourn of the king and court at Oxford at the time of the Civil War. He managed and contributed brilliant articles to the *Mercurii Aulici*, a publication devoted to the Royalist cause. Among other works he wrote *Paul's Churchyard; Libri Theologici, Politici, Historici,* and *The Assembly Man*.

Birket-el-Keroun (lake of horns), a lake of Middle Egypt, situated between 29° 54′ and 30° 44′ E. long., and crossed by 29½ N. It has an area of over 100 sq. m., and is situated 141 ft. below sea-level, having a depth at its deepest parts of about 60 ft.

Birket - el - Mariut, or **Mareotis**, a

lake in the N.W. portion of Lower Egypt, to the S.E. of Alexandria. It was almost dried up when the English, in the course of their operations against the Fr. in 1801, cut across the isthmus separating the lake from that of Abukir. The sea-water flowed in and covered a space of land measuring 30 m. by 15 m., and though the isthmus has since been restored, *100,000 ac. of cultivable land is still* under water.

Birks, Thomas Rawson (1810-83), a Nonconformist divine who joined the Church of England and became curate to the Rev. Ed. Bickersteth, then Canon of Ely Cathedral. He was elected a fellow of Trinity College, and succeeded F. D. Maurice as professor of moral philosophy at Cambridge. B. took part in many theological controversies and wrote numerous books, pamphlets, and letters.

Birmingham, a city and municipal co. and parl. bor., the chief hardware centre of the world, and, next to Manchester, the largest manufacturing tn. in England, is *situated in the* N.W. of Warwickshire, 113 m. N.W. of London by rail. With Wolverhampton, Walsall, Wednesbury, and other towns of the 'Black Country' dist., B. forms one of the most important of *industrial centres.* Including its suburbs, which extend into Worcestershire and Staffordshire, the city embraces an area of about 20 sq. m., the site being of an undulating nature (200-600 ft. above sea-level). The estimated pop. (1911) is 1,000,000. The prin. suburbs are, on the S.W., Edgbaston and Harborne, which include the botanical gardens and the Warwickshire co. cricket ground; further S., the manufacturing dists. of Bournville and Selly Oak, and in Worcestershire, Northfield and King's Norton; to the E. and S.E., Saltley, Small Heath, Sparkbrook, Balsall Heath, Yardley, and Moseley; on the N., the municipal bor. of Aston Manor; on the W., Soho and Handsworth. The pri
connecting the suburbs
centre of the city are serv
corporation tramways and by motor-omnibuses. B. is famous for its metal industries, which have been important since the latter half of the 17th century. The most important of these is the brass-working industry. Next in import
concerned with
gilt, and iron.
sive manufs. are those of pins, buttons, and other dress accessories, nails, screws, steel pens, tools cycles, motor-cars and accessories, steam and gas engines, and *machinery.* Other important industries are railway-carriage building, glass-making, electro-plating, and the manuf. of chemicals. The city has many fine streets and notable buildings. Mention must be made of the thorough fares of *New Street, Corporation* Street, Edmund Street, and Colmore Row, and amongst the chief buildings, of the Council House and Art Gallery (1874-81), containing a fine collection of modern pictures by Burne-Jones, *Millais, Hunt, David Cox,* and others, in addition to valuable collections of arms, Oriental metal-work, and pottery; the Town Hall, capable of holding 5000 people; Mason College, the Central Free Library, the Co. Court,
Central Hall of the Wesleyan Methodists. Foremost among these is the up-to-date University, with its special feature of a faculty of commerce. Other important institutions are the King Edward VI. Grammar School, founded in 1552, the Midland Institute, the Municipal Technical School, the *Municipal School of Art, and* Queen's College. Amongst the many charitable institutions of B. should be noticed the general hospital in St. Mary's Square, the Queen's Hospital, the children's, women's, and homœo*pathic hospitals, the Blackwell sana*torium, the blind institution, and the deaf and dumb asylum. The chief open spaces are Warley Woods and Park, Aston Park, Cannon Hill Park, Soho Park, Summersfield Park, Adderley Park, Victoria Park at Small Heath, and Victoria Park at Handsworth. The gov. of the city is vested in the city council, consisting of eighteen aldermen and fifty-four councillors. The chief magistrate bears the title of Lord Mayor. The gas, electric, and water supplies are in the hands of the corporation. The Welsh water supply scheme, the works of which were formally opened by King Edward in 1904, cost £6,000,000. Much of B.'s municipal
the efforts of Mr.
who, as mayor
was responsible
for many undertakings. B. claims to be the 'best-governed city in the world.' Though essentially a modern town, B. has a history that can be traced back to a period before the Conquest, the place having been a
the Anglo-Saxons. It
Domesday Book, and
£203. After the Con-
quest it passed into the possession of
The owner,
was killed
Montfort at
the battle of Evesham in 1265. It remained in the hands of the family until 1527, when the Duke of North-

umberland managed to transfer it to himself by preferring a false charge against Edward de Bermingham. After the attainder of Northumberland the property passed through various hands. In the Civil War B. evinced strong parliamentarian sympathies, for which it paid by being sacked by Prince Rupert in 1643. Subsequent outstanding events were the devastating plague of 1665, the 'church-and-king' riots of 1791, in which the famous Dr. Priestley was such an important figure, and the Chartist riots of 1839. The town was enfranchised in 1832, and now returns seven members to parliament. It became a bor. in 1838, and a city in 1889. Amongst the distinguished men closely connected with B., in addition to those already mentioned, have been James Watt, who, with Boulton, perfected the steam engine here; William Murdock, the inventor of gas; William Hutton, the historian; Joseph Parkes, and John Bright. *See* Bunce's *History of the Corporation of Birmingham*, 1885; Dent's *Making of Birmingham*, 1894; and Anderton's *The New Birmingham*, 1900.

[illegible]ty in the co. of [illegible] in the U.S.A., [illegible]ontgomery. It is the most important seat of the iron industry of the Southern States, having numerous factories, mills, and foundries. This has accounted for its rapid growth from a tn. of 3000 inhab. in 1880 to a city of 50,000 inhab., whilst the land round it has proportionately increased in value.

Birmingham Daily Post, a newspaper estab. in 1857 by Mr. John Feeney and Sir John Jaffray, being ed. till 1898 by Mr. J. Thackray, who was then succeeded by Mr. A. H. Poultney. It was the first penny provincial paper. At its foundation the politics of the paper were Radical, and after the Home Rule split of 1886 it supported the Liberal Unionist party. Later it was very closely associated with Mr. Chamberlain's propaganda, and is now Unionist in its views. The present editor is Mr. G. W. Hubbard, and the paper has offices in New Street, Birmingham, and Fleet Street, London.

Birnam, a hill in Perthshire, about 12 m. N.W. of Perth and near the tn. of Dunkeld. It was anciently included in a royal forest, and has been immortalised by the reference to it in Shakespeare's *Macbeth*. Near Dunkeld also there is a small vil. called B.

Birney, James Gillespie, American politician. He was a native of Danville, Kentucky, and became a candidate of the 'Liberty' party for the presidential chair in 1840 and 1844. He died at Perth Amboy, New Jersey, 1857.

Birni, or Old Birni, a town of Bornu, Central Africa, situated 70 m. W. from Kuka, on the Yeu. It covers a large area, and has now a pop. of 10,000 inhab., as opposed to 200,000 formerly.

Biron, Armand de Gontaut (1524-92), a Fr. soldier of the 16th century. He saw service with Brissac in Italy, and although wounded and made permanently lame in early life, he continued an active career as a soldier. He distinguished himself in the Catholic causes at Dreux, St. Denis, and Moncontour, and commanded the royal forces at the siege of La Rochelle, as a reward for which he was made a marshal of France. After 1589 he supported the interests of Henry of Navarre, and was killed at the siege of Epernay in 1592. He was a man of some literary attainment, and some of his letters are in existence at the present day.

Charles de Gontaut, Duc de Biron (1562-1602), son of the above, distinguished himself by his bravery and brilliance. He was made admiral of France, and in 1594 a marshal of France. He fought valiantly for Henry IV., and was employed by him on many diplomatic missions, but in 1602, accused of treasonable correspondence with the Spaniards, he was executed in the Bastille.

Armand Louis de Gontaut (1747-93), a descendant of the above. He fought during the War of American Independence under Lafayette, and on his return was made a marshal. On the outbreak of the Revolution he joined the revolutionaries, and was appointed to a high command. He fought in La Vendée, and he was commander of the army of Flanders. Accused in 1793 by two generals, principally, it seems, of leniency, he was executed in December 1793.

Biron, or Bieren, *see* ANNA IVANOVNA.

Biron, Ernst Johann de, Duke of Courland, and for a time practically Emperor of Russia. The son of a landed proprietor in Courland who won the favour of the niece of Peter the Great, and adopted the style de B. from the Fr. line of dukes. When his mistress became Empress of Russia, he was created Duke of Courland, and for some considerable time ruled Russia. He was a thorough autocrat, and could not brook opposition, his period of power being marked by many executions and exiles. On the death of the Empress Anna Ivanovna, he assumed the regency, and displayed great power as an administrator. He was, however,

exiled to Siberia, from which exile he was called by the Empress Elizabeth in 1741, and on his return he retired into private life. He died in 1772.

Birostrites is a name which was given to a fossil by Lamarck. It is the shell of a mollusc of the order Teleodesmacea and family Radiolitidæ, and occurs in the Middle and Upper Cretaceous.

Birrell, Augustine (*b.* 1850), politician and man of letters, born near Liverpool, the son of a Nonconformist minister. He was educated at Amersham Hall School and Trinity Hall, Cambridge, where he graduated in 1872. He subsequently studied law, became a barrister in 1875, and a bencher of the Inner Temple in 1903. From 1896-99 he was Quain professor of law at University College, London. He entered parliament as Liberal member for W. Fifeshire in 1889, and made a name as a graceful and witty orator, his efforts in this direction giving rise to the expression 'birrelling.' He was defeated in N.E. Manchester at the 1900 election, but re-entered parliament in 1906 as member for N. Bristol, and Minister of Education in the Liberal cabinet. The failure of his Education Bill to pass the House of Lords led to his resignation in 1907, when he was appointed Chief Secretary for Ireland. The first series of his *Obiter Dicta*, 1884, revealed him as an accomplished essayist with a delightful style, and was followed by a *Life of Charlotte Brontë*, 1885; the second series of *Obiter Dicta*, 1887; *Res Judicatæ*, 1892; *Men, Women, and Books*, 1894; *William Hazlitt*, 1902; *In the Name of the Bodleian*, 1905; and other books on subjects connected with *belles-lettres* and law. His first wife died in 1879. His second wife is the daughter of Frederick Locker (Locker-Lampson), the poet.

Birs, a small riv. of Switzerland, in the canton of Berne. Near it was fought the battle of St. Jacob's against the Fr. in 1444, when 1600 Swiss were annihilated in opposing 30,000 Fr., the Fr. losing 10,000 men. It was also the scene of a victory of the Swiss over the Austrians in the year 1499, after which the Emperor Maximilian I. recognised the independence of Switzerland.

Birs Nimroud, *see* BABYLON.

Birstal, a manufacturing town in the W. Riding of Yorkshire, England, 7 m. from Leeds. It has collieries and iron foundries, and manufs. of woollens, worsteds, cotton, and silk.

Birth, Concealment of, in Eng. law, by the Offences against the Person Act, 1861, is a misdemeanour, punishable by a maximum penalty of two years' imprisonment with hard labour, for any person, including the mother, to conceal or attempt to conceal the birth of a child by any secret disposition of its body, whether the child died before, after, or at the time of its birth. Avail is taken of this offence as an alternative charge in cases of persons charged with murder or manslaughter of infants, owing to [illegible] of proving that the legal sense. In Scots law, o a maximum ' imprisonment if she conceals her pregnancy during the whole period, does not call for, nor has assistance at the birth, and subsequently the child is found dead or is missing. Till 1803 such concealment was considered presumptive of murder and punished with death.

Birth, Registration of, *see* REGISTRATION.

Birth-palsy, Infantile Diplegia, or Little's Disease, a paralytic affection caused by injury at birth, through protracted labour, the use of instruments, or other causes. The condition is often not observed during the early years of childhood, but manifests itself when the child might ordinarily be expected to support itself on its own limbs.

Bisaccia, a tn. of Italy, anciently called *Ranula*. It is about 60 m. from Naples, is a bishop's see, and has a pop. of about 6000.

Bisacquino, a tn. of Sicily situated about 27 m. S. of Palermo. It has a pop. of nearly 9000, and does an extensive trade in oil and grain.

Bisalnagar, a tn. in Baroda, in the possessions of the Gaekwar. It is a fairly important manufacturing town with a pop. of about 20,000. It manufs. cotton cloths.

Bisalpur, a tn. of India, situated in the N.W. Provinces, about 25 m. S.E. from Bareilly.

Bisbee, a tn. of Arizona, U.S.A., in Cochise co., about 45 m. S.E. from Tombstone. There are the works of the New York Copper Queen Consolidated Mining Co.

Biscay, *see* VIZCAYA.

Biscay, Bay of (Fr., *Golfe de Gascogne;* Spanish, *Golfo de Vizcaya*), an inlet of the Atlantic Ocean; it sweeps in practically a straight line along the northern coast of Spain to the foot of the Pyrenees. On the W. and N. it is bounded by the coast of France, its most northerly point being the Is. of Ushant, and its most southerly point Cape Ortegal. By the Roms. the bay was called the Sinus Aquitanicus, or the Sinus Cantabricus. It forms a fairly regular curve, but has some inlets on the western coast of France, the chief being the estuaries of the Loire and the Garonne. Its

width is roughly about 400 m., and its length is approximately the same. Its southern shore, *i.e.* the northern coast of Spain, is bold and rocky, and differs very essentially from that of the Fr. coast, which is in most places low and sandy. The bay is noted for the diversity of its currents and for the storms so frequently encountered there; its danger is increased by the prevalence of westerly gales which make navigation very precarious. Its English name is a corruption of the Spanish *Viscaya*.

Bisceglio, a seaport tn. of the Adriatic. Its pop. is over 21,000. It has many fine buildings, including a cathedral, many churches, and a hospital. The port only does a small trade, but stands in a good wine producing district.

Bischof, Karl Gustav (1792-1870), a Ger. chemist and geologist, born at Wird, near Nuremberg. In 1822 he became professor of chemistry at Bonn University, and here he remained until his death. He wrote a number of treatises on chemistry, botany, and geology, and during his life-time made a number of interesting and useful experiments on inflammable gases in coal mines. His most important work was a *Manual of Chemical and Physical Geology*.

Bischoff, Mount, a tn. in Tasmania, situated 60 m. from Launceston. It is a mining dist., being specially noted for the rich yield of tin ore, which was discovered in 1872. In the short space of two years (1884-86) there was an output of more than 20,000 tons.

Bischoff, Theodor Ludwig Wilhelm (1807-82), a German physiologist and anatomist, was born at Hanover. He was educated at Bonn and Heidelberg. In 1843 he became professor of anatomy and physiology at the university of Heidelberg, and in the following year he accepted a similar chair at Giessen. In 1878, after having been at Munich for over twenty years, he retired, and died in that town. He wrote many valuable treatises and papers on biology and embryology.

Bischofswerda, a tn. in Saxony, 20 m. from Dresden, with manufs. of linens and woollens.

Bischweiler, a tn. of Lower Alsace, in the prov. of Alsace-Lorraine, situated on the R. Moder. It was formerly an episcopal tn., and had a castle, which was dismantled in 1706. A celebrated fair was also held here. It has manufs. of cartridges, carpets, and jute-cloth; hop-growing is also carried on. Pop. 8000.

Biscuit (Fr., twice-cooked) is a kind of hard, dry bread which has not risen, so made in order to be preserved without deterioration for a long time. Common sea Bs., or ship bread, are totally unfermented, whilst captain's Bs. are partly fermented. All the other forms of B. are fermented. Various machines have been invented for B.-making, and in a modern factory the Bs. are never touched by hand. The various ingredients for hard Bs. are kneaded into a stiff dough by a machine, 'braked' or rolled out between rollers, then cut up into squares by a machine which has a pair of rollers to compress it to the required thickness. The dough is then carried along on a web which takes it under a block, whose cutters cut into the shape required. The cut Bs. then travel slowly through an oven for about a quarter of an hour, on a wire frame; they are then finished and are packed in tins. There are innumerable varieties of Bs., and B.-making is a rapidly-increasing industry.

Biscuit is the name given to stoneware, earthenware, porcelain, etc., when they have undergone the first firing, and before they are finished. When in a B. state the articles are porous, and ready to take any glaze or other decoration. In the case of ordinary drain-pipes and sanitary ware the articles are glazed without being removed from the kiln or oven; common salt is thrown on the fires when the highest temp. is reached, and a glaze is thus formed. When a design is desired to be put on, the design is printed on transfer paper and applied to the biscuit-ware whilst wet. In the case of porcelain, the decoration is not put on till after the articles have been completely baked. For fuller information *see* the article on POTTERY.

Bisharin, Bishari, or Beja, is the name of a people of E. Africa. They form a stock to which belong many tribes of the region which lies between the Blue Nile and the Abys-

their language

that region.

Mohammedan

religion.

Bishop (Gk. ἐπίσκοπος, A.-S. *biscecp*), an overseer or overlooker. A term that in the early apostolic church was closely allied with the word elder. The word is used in the N.T. on sev. occasions, but is always used as synonymous with the word elder. There is no distinct difference made between these two ranks in the church, such, for example, as is made between bishops and deacons. Any differences would have been of a distinctly minor character, and even then even minute differences have not been traced. The general duties of Bs., as traced in the N.T., are general superintendence of the churches, pastoral duties which are specially emphasised, and the

duties as teachers. The significance of the term B. has changed considerably, however, with the mediæval and modern ages. Within the Catholic Church the B. is now recognised as the highest order of the hierarchy of the church, with certain special spiritual functions and with certain rights of oversight over the lower orders of the clergy. By the end of the 2nd century A.D. the claims of the Bs. had been estab. very much on the lines that we find them at the present day, and the theory of the apostolic succession was put forward. By the same time the limitation of the authority of the B. to the diocese had also been put forward and found general acceptation in the church. In the early church this was probably necessary, since the frequent attacks made upon the Christian religion made it a necessity that some definite order and ruling should be given to it. The power and the duties of the B. remained very much the same during the mediæval ages, from the time of their conception during the 3rd century. The Council of Trent laid down that the B. must be a man of approved learning, of at least thirty years of age, and legitimate. The method of election of Bs. in the Roman Church has altered considerably since the period of the early Christian Church. Bs. were originally chosen by the people, the remaining Bs. of the prov. having the right of veto. Gradually this power departed from the people and fell into the hands of the provincial Bs., who were subject to a veto from the metropolitan. Next the power passed into the hands of the cathedral chapter, still subject to the veto of the metropolitan and later of the papacy. Gradually the sole power of confirmation passed into the hands of the pope in the Western Church, and with this right of confirmation there came also the demand for the sole right of nomination. This claim v made by the papacy from the ea days of the 12th century, and in E history we have the instance of P to ratify the nomine or of the k himself, but taking the full right nomination into his own hands placing Stephen Langton in the archiepiscopal throne of the prov. of Canterbury. At the present time in the Roman Church the pope claims the right to nominate the Bs. in a number of countries, but in most the appointment has to a large extent passed into the hands of the political authorities. Spain, Austria, and France may be taken as instances where the nomination of the Bs. rests nominally in the hands of the head of the state. In the essentially Protestant countries, such as England and the U.S.A., the pope nominates the B. from a list submitted to him by the cathedral chapter. In Ireland the B. is nominated by the Bs. of the prov. In the Roman Church the nominee is subject to an examination at the hands of the legate nominated by the pope and also by the cardinalate. But even after satisfactorily undergoing this double examination he is not consecrated until about three months after his confirmation, although during this what can almost be termed probationary period he is allowed to exercise the full rights of a B. of his diocese. By the law of the church a B. is subordinate to the patriarchs and archbishops, but as far as his position in orders goes, he is inferior to none. The pope himself does not claim higher powers in the matter of confirmation, consecration, and the performance of spiritual duties than does the B. He has, in the Roman Church, full and sole authority to confer holy orders, to consecrate, to confirm, to give benediction, and to anoint kings. There are also titular Bs., that is, Bs. who have received the episcopal consecration but have not any definite diocese, and hence are used chiefly to assist other Bs. of the church, and to represent the pope. The Roman B. ranks next to a cardinal, is styled in England the Right Reverend, and receives in conversation the courtesy title of My Lord B. The Catholic Directory for the year 1912 gives the number of archiepiscopal sees as 210, the number of episcopal sees as 829, and the number of titular sees as 610, many of which are vacant. The insignia of the Roman B. are the ring, the pectoral cross, the pastoral staff, the vestments, the mitre, and the throne.

Anglican bishops. — When due allowance is made for the doctrinal posi- Bs. man con- ists. ver, rch, been 534, by a statute of Henry VIII., which was re-enacted during the reign of Queen Elizabeth. The nomination, however, is still *nominally* in the hands of the cathedral chapter, and in the disestablished Church of Ireland in the hands of a synod of the church. In England, however, the crown is notified of the vacancy, and a *congé d'é* by a letter of the crov

by law to elect this nominee, and failing such election the B. can be declared elected by royal letters patent under the Great Seal. The archbishop of the prov. is then notified and proceeds to the consecration of the B. elect. This consecration is usually carried out by the archbishop in person assisted by some or all of the provincial Bs. But a bishopric in England is also a barony, and the B. has to pay homage to and take the oath of allegiance to the king in person, according to the old rites of the feudal baronage. In England a certain number of seats are allotted to the Bs. in the House of Lords. At an earlier period all Bs. sat in the House of Lords, but since the growth of the church has led to the appointment of a great number of Bs., it has since been decided that the two archbishops, together with the Bs. of London, Winchester, and Durham, should always sit in the House of Lords, the remaining twenty-five seats being filled by the Bs. in the order of the seniority of their consecration. In addition to the powers which Bs. have of ordination, consecration, and confirmation, they have also a certain jurisdiction over the clergy of their diocese, a jurisdiction which is regulated by the Clergy Discipline Act and the Public Worship Regulation Act. The Bs. of the Church of England are ranked just above the baron of the kingdom, and are addressed by the title of 'Right Reverend.' They have also the legal style of 'My Lord:' they are allowed to marry, but their wives have no title or precedence. The insignia of the Anglican B. are the rochet and chemere, the episcopal throne, the mitre, the pastoral staff, and the pectoral cross.

Suffragan bishops.—Suffragan Bs. are those appointed by the crown to assist the B. of a diocese, who is prevented from performing his duties properly either by physical infirmities or owing to the extent of the diocese. In the Eng. Church he is appointed on the recommendation of the B. of the diocese by the crown. In the Reformed or Lutheran Church of the continent the title of B. remained after the Reformation. In many cases the spiritual duties of the B. ceased, and the title was used purely as a secular and political title. In these cases, however, where the title was used in the spiritual sense, the holder of the title did *not* claim unbroken apostolic succession. The general term used at the present time is that of superintendent. The title also still survived in other churches, such, *e.g.*, as the Moravians.

The Greek Church.—The spiritual functions of the B. of the Eastern or Orthodox Church are the same as those of the B. of the Roman Church. The Bs., however, are all chosen from the monastic orders, since the secular clergy are compelled to marry and the B. must be unmarried. The insignia of the B. of this church are much the same as those of the Western Church.

Bishop, a beverage made of wine poured upon oranges, the whole being sweetened and spiced. It can be drunk either hot or cold.

Bishop, George (1785-1861), astronomer, acquired a fortune from a wine business in London, which enabled him to fulfil a long-cherished wish to build an observatory at his residence, South Villa, Regent's Park. His interest in astronomy induced him to make a serious study of mathematics when he was fifty. Besides securing the services of highly-trained observers, one of whom discovered ten small planets, he acted as secretary (1833-9), treasurer (1840-57), and president (1857 and 1858) of the Astronomical Society.

Bishop, Sir Henry Rowley (1786-1855), Eng. musical composer, was born in London. He received his prin. training from Francesco Bianchi, who was at this time settled in London. His first composition was a piece called *Angelina*. In 1809 he produced his first opera, the *Circassian Bride*, the scenery of which, however, perished in the great fire at Drury Lane. In 1810 he was appointed composer to the Covent Garden Theatre. In 1825 he transferred himself from Covent Garden to Drury Lane. He was already one of the directors of the Philharmonic Society which had been founded in 1813. In 1822 his opera *Maid Marian and Clari* was produced, in which was the famous air *Home Sweet Home*. In 1830 he was appointed musical director at Vauxhall. In 1841 he became a professor at Edinburgh University; in 1842 he was knighted; and in 1848 he succeeded to the chair of music at Oxford. He died of cancer in April, in very impoverished circumstances. His chief works are: *Angelina*, 1804; *Tamleraux Bajazet*, 1806; *Circassian Bride*, 1809; *The Maniac*, 1810; *The Virgin of the Sun*, 1812; *The Miller and his Men*, 1813; *Guy Mannering and the Slave*, 1816; *Maid Marian and Clari*, 1822; *The Seventh Day*, 1833.

Bishop, Isabella (1832-1904), traveller and author, daughter of the Rev. Edward Bird. She began to travel at the age of twenty-two, when she went to Canada for the sake of her health. *The Englishwoman in America*, her first book, consists of letters written during this trip. Among many jour-

neys the most important was one she undertook through Corea and Shanghai, penetrating into the very heart of China. She wrote many books descriptive of her travels: *Unbeaten Tracks in Japan, Journeys in Persia and Kurdistan, Among the Tibetans, Korea and her Neighbours, The Yangtse Valley and Beyond, Chinese Pictures.* Miss Bird married in 1881 Dr. John B., an Edinburgh physician. In 1901 she rode 1000 m. in Morocco and the Atlas Mts. I. B. was the first lady fellow of the Royal Geographical Society.

Bishop, William, D.D. (1554-1624), Bishop of Chalcedon, studied theology at Rheims and Rome. In 1583, having been ordained priest, he was sent to the Eng. mission, but unfortunately for his cause, Walsingham kept him some months in Marshalsea prison. Later he was again imprisoned, this time at the English College, Rome, as leader of 'a factious party.' Difficulties arising out of the new oath of allegiance required by James I., led to his third incarceration. In 1622 B. was appointed vicar-apostolic with ordinary jurisdiction over the Catholics of Great Britain, but died before he could achieve anything in his new capacity.

Bishop Auckland, a tn. in the parl. div. of that name in the co. of Durham. It is situated about 10 m. S.W. of the city of Durham. Its area is about 651 acres, and its pop. 13,839 (1911), showing an increase of 1870 on the last census. At the N.E. end of the town stands the bishop's palace, which was originally built by Anthony Beck in the time of Edward I. It has in addition a number of other fine buildings, amongst which may be mentioned the parish church and the tn. hall. It is an important centre of the North Eastern Railway, and its pop. is chiefly employed in the mills and collieries which surround the tn.

Bishopric, *see* BISHOP.

Bishops, the Seven, the bishops who, called together by Sancroft the primate, signed at Lambeth a protest against the fresh Declaration of Indulgence issued by James II. in 1687. This declaration, proclaiming universal liberty of conscience, was [illegible] sign,' that is popish. Commissioners were ordered to deprive the bishops of their sees, but this they shrank from doing [illegible] people at large, [illegible] opposed to the [illegible] seven bishops wer[illegible] Tower on a charg[illegible] they having denounced the tion as illegal. On June appeared at the bar of the King's Bench. In spite of the fact that everything had been done to secure a committal, the 'packed' jury, overawed by public opinion, passed a verdict of 'not guilty.'

Bishop's Castle, a market town of Shropshire, situated some 20 m. S.W. of Shrewsbury and about 10 m. N.W. of Craven Arms, to which it is connected by a branch railway. Formerly an important town of the marches of Wales, it returned two members to parliament until the passing of the Reform Act of 1832. It is now included in the southern parliamentary division of Shropshire. It has lost its former importance, and the castle of the bishops of Hereford, from which it originally derived its name, has fallen into ruins. Area, 1867 ac. Pop. (1911) 1409, an increase on the last census of 31.

Bishop's Ring, name given to a peculiar tinge in the heavens, a corona or halo near the sun, called after its first observer, Bishop, who noticed it at Honolulu in the autumn of 1883, after the great volcanic eruptions at Krakatoa (Malay Archipelago). Its colour is bluish-white in the centre, shading off to reddish-brown. The diameter of the inner part was about 21°, of the outer 45°. The ring was oval in shape, the phenomenon, associated with the [illegible] eruption, being a diffraction corona due to the dust haze or tiny dust particles ejected from the volcano. All heavier particles were sifted out by gravitation, leaving the rest so nearly of a size as to be able to produce coloured diffraction. Kiessling has produced similar rings and coloured suns by means of certain processes. The B. R. was most intens[illegible]ing of 1884, ther[illegible] disappearing. The same phenomena were visible again, however, after Mt. Pelée's eruption in Martinique (W. Indies), 1902-3. *See* Symons, *Eruption of Krakatoa and Subsequent Phonomena*, 1888.

Bishop Stortford, a market tn. in Hertfordshire, about 30 m. N.E. of London. The area of the urban dist. was in 1911, 3371 acres, and the pop. 8723, showing an increase in the decennial period of 1407. In the late Saxon and Early Norman days it was the property of the Bishop of London: [illegible] ruins of the so-called Bishop's [illegible]son are still to be seen. It has an [illegible] school (Elizabethan). School, and many other [illegible]stablishments are found [illegible]iefly employed in brew-

ing and malting, and holds important horse and cattle fairs.

Bishops Waltham, a tn. of Hampshire, about 10 m. S.S.E. of Winchester. From the beginning of its history it has been the possession of the see of Winchester, and its castle built by Henry de Blois was completely ruined during the Civil Wars. It is in the dist. of Droxford, and has an area of 1122 acres, and a pop. of 4570 (1911).

Bishop Wearmouth, a parish in the co. of Durham, in reality a suburb of Sunderland, forming the southern district of that town.

Bishopweed, a popular name of *Ægopodium Podagraria*, is a species of Umbelliferæ common to Britain. It is also called gout-weed, goat-weed, and herb Gerard.

Biskra, the name of a tn. of Algiers about 150 m. S.W. of Constantine, and in the arron. of that name. It lies in the Sahara about 360 ft. above the level of the sea, and is on the bank of the Wad B. It is a well-know Fr. winter resort, and is protected by the Fort St. Germain, which is capable of defending the whole pop., and is practically unassailable. Its climate in the winter months is delightful, *and can hardly be matched anywhere.* The pop. of the town is about 4000.

Biskupitz, Prussian tn. in the prov. of Silesia and the gov. of Oppeln. Coal-mining is the chief industry.

Bisley, a par. in the co. of Surrey, England, in the Chertsey parliamentary division, 7 m. N.N.W. of Guildford, and 2 m. N. by W. of Brookwood Station. The pop. of the par. is less than 1000, and B. is chiefly remarkable for the fact that since 1890 the National Rifle Association have held their annual meeting, in July, lasting for a fortnight, at the ranges on B. Common. The competitions were formerly held at Wimbledon, but the introduction of the small-bore rifle rendered it necessary for the ranges to be longer and safer, and B. was therefore chosen. The competitions now are chiefly for volunteers, but there are some open for members of the regular forces, the militia, the yeomanry, colonials, and civilian members of the National Rifle Association. The most important of the competitions are as follows: The King's Prize, formerly the Queen's Prize, which was founded by Queen Victoria in 1860, is of the value of £250, and carries with it the gold medal of the National Rifle Association. The competitors, who must be past or present volunteers, shoot seven shots at 200, 500, and 600 yds.; the best 300 are thus selected, who shoot 10 times at 600 and 800 yds.; the best 100 of these shoot 10 times at 800, 900, and 1000 yds. Other competitions open to volunteers only are the St. George's Prize, at which the competitors shoot 7 times at 500 and 600 yds., and 10 times at 800 yds.; and the Prince of Wales' Prize, for 10 shots at 200 and 600 yds. Then there are the prizes given by various new-papers: by the *Daily Graphic*, open to all comers, for 7 shots at 200 yds.; by the *Graphic*, open to all, for 7 shots at 500 yds.; and by the *Daily Telegraph*, for volunteers only, for 7 shots at 600 yds. There are various prizes for teams of riflemen—the Elcho Challenge Shield, for the best four 'eights' of the different nationalities of the British Isles: for this 15 shots at 500, 900, and 1000 yds. are fired. The Ashburton Challenge Shield is for the best eight of public school volunteer corps; 7 shots at 200 and 500 yds. are fired. For the Humphry Challenge Cup, open to university teams, 15 shots at 800, 900, and 1000 yds. Teams from the mother country and the various colonies compete for the Kolapore Cup, firing 7 shots at 200, 500, and 600 yds.

Bismarck, a tn. of Prussian Saxony, situated 37 m. to the N. of Magdeburg: pop. 2200.

Bismarck, the cap. of N. Dakota, in the co. of Burleigh, United States. It is situated on the l. b. of the Missouri, on the N. Pacific Railway. It has an alt. of 1660 ft. above sea-level, and is the head of the navigation of the Upper Missouri. Pop. 4000.

Bismarck Archipelago is the name of a group of islands which lie to the N.W. of the Solomon Islands and to the N. of the eastern extremity of New Guinea. Their former name was New Britain Islands, and they were discovered by Dampier in 1699, but in 1885 Great Britain came to an agreement with Germany, by which they were assigned to the Ger. sphere of influence, and their name was then changed. The prin. islands of the archipelago are New Pomerania, formerly called New Britain, and New Mecklenburg, formerly called New Ireland, which are separated from each other by St. George's Channel, in which the currents are of great violence and subject to no fixed rules: Dampier Strait separates New Pomerania from New Guinea, and another important is., New Hanover, lies to the W. of the north-western extremity of New Mecklenburg, from which a tortuous system of reefs separates it. All the islands of the archipelago are included in the Ger. protectorate of New Guinea co., and the prin. Ger. stations are situated as follows: at Herbertshöhe in the N.E. of New Pomerania, the seat of the gov. both of B. A. and the Ger. portion

of the Solomon Islands; on Blanche Bay, in the N. of the Gazelle Peninsula; and on a small is. in the bay called Matupi. The islands are not unhealthy, and cotton plantations have been started by the Gers. with native labourers. The inhab. of the islands are skilled in agriculture, but practise cannibalism. At present coconuts and copra (dried [illegible] are the c these are threaded on long strips of split cane form the money used by the natives.

Bismarck, Henri Ferdinand Herbert, Count of (1849-1904), eldest son of Prince Bismarck. He served in the army, 1870-71, then entered upon a diplomatic career, becoming secretary to his father. He was secretary to the embassies in turn of Rome, London, St. Petersburg, and was several times charged with important negotiations, including a mission to London in 1881. In 1885 he was made Secretary of State for Foreign Affairs. Count von Bismarck married Countess Margarete Hôyos.

Bismarck, Otto Eduard Leopold Von, Prince, Duke of Lauenburg (1815-98). the greatest of Ger. statesmen. He was born on April 1, being the son of a gentleman of good family and of

He was educated at a private school in Berlin, and later at the Gymnasium of the Grey Friars in the same town. On leaving school he attended the university of Göttingen, and after spending a year there he returned to Berlin and passed the examinations necessary for his entrance upon a career in the diplomatic service. He did not, however, enter this at once, but spent the early years of his youth in travelling, and in residence on his home estates. He early took a great interest in public affairs, and his wide reading and extensive travelling at one time seemed likely to allow of his having rather wide and liberal views, but his religious convictions and the influence of religious revival led him to adopt the opinions in favour of monarchical government for which he became so famous. In 1847 he married Johanna von Puttkamer. During the five years which followed his marriage he took an active part in the politics of Prussia, being bitterly opposed to any scheme which seemed either to be revolutionary or to savour of restriction of the monarchical principles or to reduce the power of the Christian monarch. He distinguished himself by the originality and zest with which he defended his position, and he showed by his bitter opposition to various proposed constitutions that he regarded revolutionary movements as tending to reduce to a very great extent the power and influence of Prussia as a Ger. state. In 1851 he was appointed Prussian representative at the Diet of Frankfurt, and during the years which he spent in this position he gained a knowledge of Ger. politics which served him very considerably in the zenith of his career. He was frequently employed [illegible] completed sev. with various result of this eight years' diplomatic service, however, was to open his eyes to the true position of Austria with regard to Prussia. Up to this time he had regarded alliance with Austria as not only probable, but desirable, since Austria would support the Conservative principles of Christian monarchy. But he learnt now that Austria desired only the abasement of Prussia, and henceforth his policy changed, and he saw that the greatness of Prussia could come only after the downfall of Austria. In 1858 he went to Petersburg as the Ger. ambas., and for some years remained there with little influence over the home gov., which was Liberal, and distrusted him. But gradually he began to become more powerful, the details of events at home were sent him, he was frequently consulted, and at last was made minister in Paris. Here he renewed his previous good understanding with Napoleon, and finally from here he was recalled in Sept. 1862, and appointed by the king Minister President and Foreign Minister. His appointment as Minister President was intensely unpopular. His duty was to carry on the gov. of the country in the face of the opposition of the Lower House. It seemed impossible that he should succeed, and that he could do anything but resign at an early date. But it was necessary to the king that he should succeed and allow time for the reorganisation of the army, and in the face of violent and often personal opposition, in spite of lack of budgets, he was able to perform his work for the king. He soon began to make his power felt. The policy of Prussia had long lacked resolution, now it was to be noticed for its absolute resoluteness. To the meeting of Ger. princes at Frankfurt Bismarck refused to allow the King of Prussia to go. Then came the rising of the Poles, and Bismarck earned the gratitude of Russia and the contempt of Europe by offering Ger. aid in its suppression. Finally came the question of Schleswig-Holstein, when Bismarck refused to support the Augustenburg claim, but in alliance with Austria defeated Denmark and

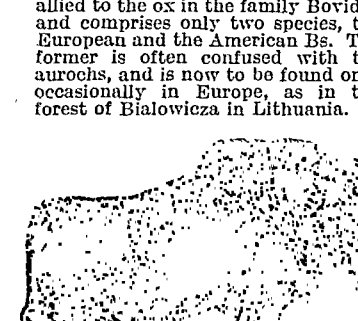
prepared the way for the ultimate annexation of the prov. by Prussia. The next step was war with Austria. In this war B. entered in the most calculated way. He saw that the destruction of Austrian power was the only means of Prussian greatness, he waited until everything was in his favour, until he had gained the support of France and Italy, and then in 1866 he struck and was successful. The war of 1866 is in a greater degree than the war of 1870 the turning-point in the greatness of modern Germany, since it decided once and for all that Prussia should be the dominant power of Germany, and that Ger. unity should be the work of Prussia. He was moderate in his settlement, and required no territory from Austria, but made a confederation of North Germany, and did not attempt the unity of the whole of Germany in order not to alarm France. The greatness of Prussia was not to be disturbed by lack of calculation—when the time was ripe unity would come by the sword of Prussia, but there were to be no chances of failure. The Austrian war created a new position for B., he now became sole responsible minister, his title being changed to Chancellor in 1871. He now began to reconcile his erstwhile opponents, and from being regarded as the opponent of National Unity of Germany, he now became its recognised leader. The struggle with Austria led almost of a necessity to war with France. At one period armed intervention by the Fr. seemed inevitable, but this was avoided. France now demanded territory on the left of the Rhine, and being refused proposed, as a return for acquiescence in the unity of Germany, the support of the Prussians in the annexation of Luxembourg and Belgium. War was inevitable, and as in the case of Austria, Prussia bided her time. During the years which followed there were many causes of quarrel, which culminated in the opposition of France to the candidature of a prince of Hohenzollern to the Spanish throne and the publication of the Ems telegram, which made war inevitable. During the Franco-Prussian war he accompanied the army and conducted negotiations with the French, and completed the arrangements for the entrance of the southern states into the Federation. His work after 1871 was completely occupied with the domestic policy of Germany. He had a long and strenuous quarrel with the Roman Catholic Church, and also presided over the Congress of Berlin of 1878. The death of the Emperor William in 1889 was a grave blow to him, and in 1890 he was dismissed by the Emperor William II. A reconciliation took place in 1893, and his 80th birthday in 1895 was regarded as a national event. He died on July 31. *See* Bismarck's *Edanken und Erinnerungen* (Eng. trans. *Bismarck: His Reflections and Reminiscences*, 1898); Lowe's *Bismarck*, 1895; Headlam's *Bismarck and the Foundation of the German Empire*, 1899; *The Love Letters of Prince Bismarck* (Eng. trans. 1901); Sybel's *Die Begründung des deutschen Reichs*, 1889-94; Kohl's *Fürst Bismarck*, 1891-2; Blum's *Bismarck und seine Zeit*, 1894-5; and for bibliography, Schulze and Koller's *Bismarck-Literatur*, 1896.

Bismarckburg, a station in the Ger. E. Africa, 2° N. and long. 0° 33′ E., 130 m. from the coast. It is the cap. of the mountainous dist. of the same name which lies to the S.E. of Lake Tanganyika, and includes Lake Rikwa.

Bismuth, a metallic element. It was probably known in the middle ages under the name marcasite, but was often confused with zinc and antimony. It is a comparatively rare metal, usually occurring in nature in association with ores of silver and cobalt. The greater part of the world's supply comes from Schneeberg in Saxony, Joachimsthal in Bohemia, Cornwall, Bolivia, and Peru. The ore is roasted and then smelted with iron, carbon, and slag; two layers are thus obtained, the lower one containing nearly all the B., which may be removed by tapping the lower end of the cylindrical retort in which the process is carried out. The crude B. is then purified by heating it on an inclined iron plate, when the pure B. melts and runs down into the receptacles provided. B. is a hard brittle metal with a reddish-white colour; its specific gravity is 9·75, it melts at 264° C., and expands as it solidifies. It burns with a bluish flame and readily oxidises at ordinary temps.: it also combines directly with sulphur and with elements of the chlorine group. B. forms many useful alloys with low melting-points under the general name of 'fusible metal.' These alloys are used in making type metal, as their property of expanding on solidification serves to produce a good cast; for soldering and for the manuf. of safety plugs in boilers, as the constituents of the alloy can be so arranged as to provide a melting-point at a particular temp. B. forms four oxides, of which the yellowish trioxide is the most important. Two chlorides, two sulphides, and a sulphate may also be prepared. Most important of the B. compounds, how-

ever, is the nitrate together with the basic nitrates formed by diluting the acid solution with water; magistery of B., flake white, and Spanish white are some of the salts thus produced. The basic carbonate, prepared by *treating B. nitrate with ammonium* carbonate, is much used in medicine for easing painful gastric affections, such as dyspepsia, diarrhœa, ulcers, and cancer. The action is that of a direct sedative, the salts coming into contact with the nerve endings of the mucous membrane. The insoluble salts are opaque to X-rays, and abnormalities in the structure of the alimentary canal can be demonstrated on a fluorescent screen by following the course of a large dose taken as an emulsion.

Bison, the name of a ruminant allied to the ox in the family Bovidæ, and comprises only two species, the European and the American Bs. The former is often confused with the aurochs, and is now to be found only occasionally in Europe, as in the forest of Bialowicza in Lithuania. It



BISON

is more than 6 ft. high at the shoulders, and is a most powerful and formidable animal, able to level with a thrust a tree 6 in. in diameter. It is massive, has thick, elongated withers, and its head is covered with a mane, often a foot in length, which is thickest in winter and inconspicuous in the females; the eyes are small and savage. It has a strong sense of smell and can be approached only from the leeward. In habit it is herbivorous and fond of the barks of trees; it is *gregarious*, but domestic cattle rouse its fury, and it attacks them fiercely; attempts to mix the breed have failed. A short deep grunt is its method of articulation, and can be heard at a considerable distance. The American B. differs little from *B. bonasus*, the European B., but they are smaller, shaggier, and fiercer, and can withstand the attack of any animal but the *powerful grizzly* bear. It is gradually becoming extinct, but in a few places, such as Yellowstone Park, herds are carefully preserved. *See* J. A. Allen's *American Bisons*, 1876.

Bissagos Islands, a group of islands off the western coast of Africa, consisting of about sixteen large and a great number of small islands. They are situated between lat. 10° 2′ and 11° 55′ N., and long. 15° and 17° W. Most of the islands are well wooded and well populated, but are extremely unhealthy for *Europeans*. They belong to Portugal.

Bissão, a seaport in Portuguese W. Africa, situated E. of the is. of the same name, in the mouth of the Rio Geba; pop. 2000.

Bisschop, Christoffle (Christoph), Dutch genre-painter, born at Leeuwarden, 1828. He was a pupil of Schmidt and of Van Hone, also later of Comte and Gleyre in Paris. His wife is also a painter in the same style, and they now live at the Hague. Among his works are 'Tronwdag' (Wedding-Day), which won him a reputation, 1871; 'Rembrandt going to Lecture on Anatomy,' 1887; 'Burgomaster's Daughter;' '. . . osity Shop;' . . . tening-Day in . . . in Friesland;' 'The Prisoner's Song;' 'The Critical Moment;' 'Crown Jewels:' 'The Lord has given, the Lord has taken away,' 1880; 'Visit to Grandmamma,' 1883. *See* Müller, 52.

Bissell, George Edwin (*b.* 1839), American sculptor, son of a marble-cutter in Connecticut. Served during Civil War (1862-65). In 1875 came to study in France and Italy. Among his chief works are a national monument at Waterbury, Connecticut, a statue of Abraham Lincoln at Edinburgh, a *relievo* of 'Burns and Highland Mary' at Ayr, and emblematical groups at New York, Buffalo, St. Louis, and elsewhere.

Bissen, Herman Wilhelm (1798-1868), a Danish sculptor, born in Sleswick, and educated under Thorwaldsen at Rome, who on his death left instructions in his will that B. should finish his uncompleted works. B. was in 1850 appointed president of the Academy of Fine Arts at Copenhagen. Amongst his chief works are: 'Cupid sharpening his Arrow,' 'Valkyrie,' an 'Apollo,' and a 'Venus.' One of his most famous works, 'Orestes,' perished in the fire at Copenhagen, 1881.

Bisset, Charles (1717-91), physician and military engineer, was appointed second surgeon at the military hospital, Jamaica, in 1740. After five years' travel in the West Indies and America, he came home and accepted

an ensigncy in the 42nd Highlanders. He crossed with his regiment to the Low Countries, and was attached to the engineers' brigade because of his excellent reports on the siege of Bergen-op-Zoom. Finally, he again practised medicine, this time at Skelton, Yorkshire. His curious versatility is shown in his publications, which include *Theory and Construction of Fortifications*, 1751; a treatise on scurvy, 1755; and *An Essay on the Medical Constitution of Great Britain*.

Bissextile, or Bissextus Dies, the intercalary day inserted by the Julian calendar in February every four years. According to the Roman method, the insertion was made after the 24th of the month. The 24th would be, in the Roman calendar, the 6th of the Kalends of March, and hence the inserted day was the second 6th or 'bissextus.' The day is now inserted for convenience at the end of the month.

Bisson, Alexandre Charles Auguste, a Fr. writer of vaudevilles, *b.* in 1848. He began his career as a clerk in the dept. of the Instruction Publique, but gave up this post in order to devote himself entirely to writing for the stage. His clever wit, gaiety, and power of keen observation quickly brought him the favour of the public. Among his most successful earlier vaudevilles are: *Un Lycée de Jeunes Filles*, *Le Député de Bombignac*, *Une Maison Délicate*, and *Le Roi Koko*. Since 1899 the following have been produced at different Paris theatres: *Docteur* (written in collaboration with G. Thurner), *Le Bon Juge*, *Les Apaches*, *Les Trois Anabaptistes* (in collaboration with J. Berr de Turique), *Le Peril Jaune* (with Saint-Albin), and *La Petite Maison*, with music by William Chaumet. A. B. wrote also the libretto for *Capitaine Thérèse*, a comic opera by Robert Planquette.

Biston, in entomology, is a name given by Dr. Leach to a genus of lepidopterous insects of the family Geometridæ. Three British species of these moths are *B. prodromaria*, the oak beauty; *B. betularius*, the pepper moth; *B. hirtarius*, the brindled beauty.

Bistre, a warm brown-coloured pigment, which is prepared generally from beechwood soot.

Bistritz (Hungarian *Besztercze*). a town of Bohemia, Austria-Hungary, situated in 47° 7′ N. lat. and 24° 30′ E. long., on a riv. of the same name, which is a trib. of the Szamos. It is the chief tn. of the circle of B., and is in a beautiful situation. Tanning is practised, and there are spinning-mills. Pop. 10,000.

Bitche, or **Bitsch,** a town in Germany, situated in Lorraine, and about 25 m. S.E. from Saargemünd. It is strongly fortified, the citadel having been hewn out of solid rock. It was twice unsuccessfully besieged, in 1815 by the Prussians, and 1870 by the Gers. It was taken by the Fr. in 1766, but regained in 1871. Pop. 3000.

Bithur, a tn. in the Cawnpore dist. of the United Provs. of India. It is situated a little over 10 m. from the tn. of Cawnpore, and has a pop. of about 7000. Interest in the tn. is due to the fact that it played an important part in the mutiny of 1857. Nana Sahib made it his headquarters and from here emanated the rebellion. Havelock captured and stormed the tn. in July 1857, when the palaces of the Nana were destroyed.

Bithynia, an ancient div. of Asia Minor, separated from Europe by the Propontis and the Bosphorus, and bounded on the N. by the Black Sea. On the E. it adjoined Paphlagonia, on the W. and S.W. Mysia, and on the S. Phrygia. It is very mountainous and its mts. are all well wooded, but near the sea coast there are many very fertile valleys. Its natural sources of wealth are still in a very undeveloped state, although its forests provide the material for an excellent and flourishing industry, and coal is also known to exist in the country. The Bithynians are supposed to be of Thracian origin. They became part of the Lydian monarchy under King Crœsus, and later were conquered by the Persians (546 B.C.). It became, however, ultimately one of the most flourishing of the smaller kingdoms of Asia Minor, its cap. Nicomedia being founded by the first of its native kings nearly 300 years B.C. The last native king, Nicomedes III., made the Romans his heir in 74 B.C. It became a Rom. prov., and for some time under Trajan was governed by the younger Pliny. In 1298 the Turks under Osman invaded the country, and it became in the course of time a Turkish possession. The sole flourishing towns at the present time are Prusa (Brusa), Ismid (Nicomedia), and Scutari.

Bitlis, a town in vilayet of Bitlis, Turkey in Asia, situated on the Bitlischai, a trib. of the Tigris, in a high valley, 4700 ft., amid the wild mt. scenery W. of Lake Van. Pop. 35,000 (majority Kurds), with 12,000 Armenians. An old Arab castle is said to occupy the site of a fortress built by Alexander the Great. The prin. industry is the weaving of red-cloth. Tobacco is largely grown, and there is a trade in gum and fruit.

Bitonto, a tn., prov. of Bari, Apulia, Italy. Pop. 30,617. It lies 10 m. W. of the tn. of Bari. The old mediæval walls still remain, and there is a fine

early 16th century palace, but its chief glory is the unrestored and unspoiled cathedral, a fine example of Italian Romanesque architecture.

Bitter Apple, *Cucumis* (or *Citrullus*) *Colocynthis*, is the fruit of a species of Cucurbitaceæ, and is allied to the cucumber. It is a round, yellow fruit, and the pulp is used as a purgative under the name of colocynth (*q.v.*). Other names for it are bitter cucumber, colocynth gourd, and coloquintida.

Bitterfeld, a tn. and commune in the prov. of Saxony, Prussia, on the l. b. of the Mulde, 20 m. from Leipzig. There are lignite mines, and iron foundries. Its manufs. are earthenware, drain-pipes, roofing felt, etc.

Bitter Lakes, known as the Great and the Small, are lakes near Suez, and they form part of the Suez Canal. These lakes were almost dry when the canal was cut.

Bittern, a large wading bird, buff-coloured, speckled with black and tawny brown, living in swampy ground. It has a short neck and long bill; its habit [illegible] and bill in a vertical it among the reeds, day, hunting its food



BITTERN

and fish—towards nightfall. Its loud booming call marks the breeding season. The European B. (*Botaurus Stellaris*) is rarely seen now in Great Britain, but it was once common, especially in the Fens. The genus *Botaurus* belongs to the family Ardeidæ, which includes the herons.

Bitter Root Mountains, a long range of mts., with a maximum alt. of between 9000 and 10,000 ft., forming part of the boundary between Idaho and Montana, U.S.A. It is an outlying part of the Rocky Mt. system, branching off S., where the main range turns E. through Montana.

Bitters, beverages containing substances imparting a bitter taste, and usually including about 40 per cent. of alcohol. The bitter principle is generally derived from orange-rind, quinine, quassia, angostura, gentian, or hops, and is imparted to the liquid by simple maceration and filtration, or, in the case of some household remedies, infusion and decantation. The action of most B. is to stimulate the sense of taste and the secretion of the gastric juices; they are therefore mild tonics and appetisers. Any other remedial quality possessed depends upon the nature of the drug included, apart from its bitter taste. Many of them are used as digestives before a meal, such as the beverages known as orange, angostura, and peach B. Generally speaking, their occasional use in small quantities is beneficial or at least harmless, but their continual use has an irritating effect upon the stomach, apart from the alcohol they usually contain. Many bitter infu- [illegible]

been associated with preparations of real medicinal value.

Bitterspar, a general name for the crystallised varieties of dolomite, or magnesian limestone. It possesses various degrees of transparency, and has a somewhat pearly lustre, whence it has been called pearlspar.

Bittersweet, the popular name of the 'wood- [illegible]
dulcamara.
lation of *di*
which is fir
It is a common frequenter of hedges and thickets, with a slender climbing stem, pointed leaves with two projections at the base; the flowers, resembling those of the potato, are lilac-coloured with yellow centres. The scarlet fruit, growing in clusters, are poisonous in large quantities.

Bitterwood, a name given to the product of many plants, but especially to that of *Picræna excelsa*, a species of tropical Simarubaceæ. In this case it is also known as Jamaica quassia, which is a good tonic. *Xylopia sericea*, a species of Anonaceæ, is a tree with bitter wood in Brazil, and *X. glabra* of the W. Indies.

Bitumen, a term applied generally to minerals of vegetable origin, consisting of complex hydrocarbons. They comprise many species, ranging from natural gas, through petroleums and asphaltes, to the softer varieties of coal. Natural gas is dealt with separately, as also is petroleum, which passes by insensible gradations into maltha, or viscid B., and that again

into asphalte (*q.v.*), or solid B. Of the viscid Bs., the most important is Elaterite, or mineral caoutchouc. It is a dark brown or black substance, usually soft, and is elastic like india-rubber. It is found at Castleton in Derbyshire in compact masses along with lead ore and calcite. A mineral tar also occurs in Derbyshire and near Dingwall in Ross-shire. A substance with some similarities to elaterite is found in the Settling Stones lead mine in Northumberland; this occurs in the form of drops incrusting the walls of a vein of lead ore. It is hard and brittle, and does not melt under 200° C. Other Bs. are Berengelite, a dark brown resinous substance found in Arica, Peru; Bielzite, a brittle black solid found in Transylvania; Piauzite, a dark-brown coal-like substance obtained amongst the brown coal at Piauze in Carniola; Wurtzilite, a hard black solid; and Uintahite, or Gilsonite, both found in the Uintah Valley, near Fort Duchesne, Utah; and Albertite, a jet-black substance, resembling asphalte, which is obtained in Nova Scotia.

Bituriges, a Celtic people of anct. Gaul. They were divided into the B. Cubi, whose cap. was Avaricum (Bourges), and the B. Vivisci, cap. Burdigala (Bordeaux). The former joined in the rebellion of Vercingetorix (52 B.C.), their cap. was taken by the Roms., and its people massacred.

Bitzius, Albrecht (1797-1859), Swiss novelist, usually known by his pseudonym, Jeremias Gotthelf, the name of the prin. character in his first novel *Bauernspiegel*. He was the son of a pastor, and became his father's assistant in 1822, and from 1831 till his death in 1854 was pastor at Lützelflüh, in the Upper Emmenthal, there he wrote his novels of peasant life and character, true pictures drawn from real life, told in the Bernese dialect, and with simple moral teaching. They include *Bauernspiegel*, 1837; *Leiden u. Freuden eines Schulmeisters*, 1838; *Uli der Knecht* (The Serf), 1841, and its sequel, *Uli der Pächter* (The Tenant), 1849; *Anne Bäbi Jowager*, 1843; *Käthi die Grossmutter*, 1847; *Die Käserei in der Vehfrende*, 1850; *Erlebnisse eines Schuldenbauers*, 1854. *See* Works, 24 vols., Berlin, 1856-61, 10 vols., Bern, 1898-1900; and Life, by J. Ammana, 1881, in *Sammlung Bernischer Biographien*, and by Barlets, 1902.

Bivalves, Pelecypoda or Lamellibranchiata, form one of the largest groups of molluscs, and are characterised by their two bilaterally symmetrical, limy plates or valves to the right and left of the body. The mantle secretes a covering over the whole outer surface, and this forms at the dorsal middle line an elastic membrane, called the *hinge-ligament*, which connects the two valves. The body of this mollusc is itself bilaterally symmetrical and is compressed; the head is extremely rudimentary; the foot is usually present, when it is ploughshare-shaped, may contain some of the viscera, and has often a byssus gland which serves in the attachment of the animal. The nervous system consists of three pairs of ganglia; the digestive system commences with a well-ciliated mouth which catches small particles of food drifting in the water, there are no jaws or tongue, and a short œsophagus leads to the stomach; respiration is effected by means of two ctenidia, which are developed right and left of the elongated body. The heart consists of a ventricle and two auricles, and the reproductive organs occur in the foot, the sexes being usually distinct. B. are found all over the world and more than 5000 species are known to exist. They live chiefly in the sea, where they are found at all depths, but some inhabit fresh water; muddy and sandy shores are those which they prefer. Nearly all feed on vegetable matter, but the Septibranchia, a wholly marine order, are carnivorous. Many remain attached to one spot during life, others can crawl slowly, while others again swim by opening and shutting the valves of their shell. Some, *e.g. Toredo*, are boring animals, and have a damaging effect on the wood of ships. They are of use to man in various ways: some are edible, *e.g.* mussels, cockles, oysters; savages use the shells in place of coins; pearls are obtained from oysters, and mother-of-pearl is of value commercially; many B. are used as bait in deep-sea fishing. In the classification of Lamellibranchiata zoologists are divided, but most agree in grouping them into four orders: Protobranchiata, with gill-filaments flattened and not reflected, *e.g.* Yoldia; Filibranchiata, with long, reflected gill-filaments, united by ciliary junctions, *e.g.* mussels; Eulamellibranchiata, with branchial filaments united by interfilamentar and interlamellar junctions, both vascular, *e.g.* clams, cockles, freshwater mussels; Septibranchiata, with gills transformed into a muscular septum, *e.g.* Poromya.

Bivouac (from Ger. *Beiwache, bei*, by, and *wache*, watch), a temporary camping of soldiers in the open air. No tents are used, and each soldier remains fully dressed, with his arms close at hand. At first only the guards had to B. while the rest of the army remained in camp, but since the time of the French Revolution it has been

customary for forces actually engaged or about to be engaged in conflict to B. This enables them to dispense with tents and all encumbrances, and greatly facilitates speedy action. Temporary protections of straw and branches are erected if possible, and the position is chosen so as to afford as much protection from the inclemencies of the weather as can be obtained. There are various plans for Bs., according to the regiment and occasion, but the chief object always is that all should be as ready for action as possible. Since to remain in B. is very trying for the soldiers, it is only resorted to when action is imminent. In hot countries, such as India, it is still found necessary to carry tents. Great care is generally exercised in the selection of ground.

Biwa Lake, or Oits Mitsoo, is an immense lake of Japan, in the is. of Hondo. Tradition has it that the lake was formed by an earthquake in 286 B.C. It is 12 m. broad and 36 m. long, and is famous for its great beauty, especially at its southern extremity. It is 10 m. by water from Kioto. The R. Yodogawa drains it, and the Lake Biwa Canal connects it with the Kamogawa Canal. The waters are used for the factories and mills of Kioto.

Bixa Orellana is the single species of its genus and Bixaceæ: it grows in and the W. Indies. small tree which bears seeds covered with a soft, sticky, vermilion-coloured rind, which furnishes the arnotto of commerce, used in dyeing confectionery.

Biysk, chief tn. of a dist. in the gov. of Tomsk, Western Siberia, Russia. It is an important centre of trade by the rivs. Ob, Buja, and Katun, near the confluence of which it lies, and by the pass over the Altai Mts. into Mongolia. Pop. 17,206.

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m. S.E. from Toulon and 60 m. by rail N.N.W. from Tunis. The port consists of an outer harbour of 300 ac. [illegible] two

mercial harbour and thence to Lake Bizerta, a deep circular inlet of the sea: at Sidi Abdallah, in the S.W., lie the dry-docks, quayage, and other works necessary to make B. a fully equipped station of the highest importance to Fr. naval strength in the Mediterranean. It is strongly fortified by coast batteries, second only to Toulon. The modern tn. of B. (Arab. *Ben-zert*), lies N. of the canal, and S. of the Arab tn. and the anct. citadel. The naval and military tn., *Ferryville, is separate.* The anct. name of the harbour, always the safest on the coast, was Hippo Zarytus or Diarrhetus, once a Tyrian, later a Rom., colony. It was taken by the Arabs in the 7th century and by Spain in 1535. Long neglect allowed the fine harbour to decay utterly till the declaration of the Fr. protectorate over Tunis in 1881, and its subsequent rise to importance as a naval station.

Bizet (Alexander César Léopold) Georges (1838-75), a Fr. musical composer, born near Paris, was the son of a teacher of singing; he studied under Halévy at the Conservatoire, and won the Prix de Rome, 1857, with a cantata, *Cloric et Clotilde.* His operas, *Les Pêcheurs de Perles,* produced 1863, *La Jolie Fille de Perthe,* 1867, and *Djamileh,* 1872, suffered in popularity from the charge of 'Wagnerism,' reserved at the time with little understanding for all music which appeared to the critics as strange or progressive. His music for Alphonse Daudet's drama, *L'Arlésienne,* 1872, was more successful. His masterpiece, *Carmen,* 1875, was written to an adaptation by Meilhac and Halévy of Mérimée's tale of the same name. B. married a daughter of [illegible] in 1865. He died shortly [illegible]e first production of *Carmen.* [illegible]es by Pigot, 1886, and Bellaigne, 1891.

Bizzari, Pietro (1530?-84?), Italian historian and poet. His principal historical works are: *History of the War in Hungary,* 1569, and *History of the Cyprian War between the Venetians and Solyman.* Both works are in Latin.

Bjela, a town in Russian Poland, situated on the R. Krzna, and in the gov. of Siedlec. It has a considerable corn trade.

Bjerregaard, Henrik Anker (1792-1842), Norwegian author. Educated for the law and became a chief justice. Among his best known books are *Blandede Digtninger,* 1829-30, and *Digtninger,* 1848; he is also the author of the Norwegian national anthem, *Sönner af Norge,* and an operetta, *Fjældeventyret,* 1825, which took a high place in Norwegian drama.

Björn of Scardsa, or Björn Jonsson (1575-1656), Icelandic historian. Author of *Annals,* written with considerable insight in beautiful language. For his works, *see* Vigfusson and Powell's *Corpus Poeticum Boreale,* 1883.

[illegible] built town of [illegible], of Abo. It is [illegible] f the R. Kumo [illegible] Shipbuilding is the chief industry, and it exports fish, timber, and pitch. Pop. 13,000.

Björnson, Björnstjerne (1832-1910), a Norwegian dramatist, novelist, and poet, born in Österdal, Norway, was the son of the pastor of Kvikne, who six years later moved to the beautiful district of Romsdal, where the poet's childhood was spent. In 1852 he graduated at the university of Christiania, where he took to journalism, chiefly dramatic criticism, but soon embarked on his independent literary career. His series of pastoral novels, some of the most exquisite pictures of peasant life in modern fiction, began with *Synnöve Solbakken*, 1857, and include *Arne*, 1858; *En Glad Gut* (A Happy Boy), 1860; and *Fiskerjenten* (Fisher Maiden), 1868. In 1897 he was made director of the Bergen Theatre, where Ibsen had been stage-poet and had produced some of his earlier plays. B.'s dramatic work began with his national saga plays, the earliest being *Mellem Slagene* (Between the Battles), produced 1857; and *Halte Hulda* (Lame Hulda), 1858. In 1860 he was given a travelling allowance by the gov., and spent from 1860-63 in Italy and the Continent. *Kong Sverre*, 1861; the great trilogy, *Sigurd Slembe* (Sigurd the Bastard), pub. 1862, produced 1865; *Sigurd Jorsalfar* (the Crusader), not pub. till 1872, complete his heroic and historical dramas. On his return to Norway he became manager of the theatre at Christiania, and was awarded the 'poet's pension' (*Digtergage*). His literary reputation was now estab. His tragedy, *Maria Stuart i Skotland*, 1864, and a comedy *De Nygifte* (The Newly Married Couple), 1865, were produced under his management. At this period he threw himself into politics as a strong reformer and radical. From 1868-74 he was constantly travelling, not only in Norway, but on the Continent, speaking and lecturing and spreading his views not only on politics, but on literature, art, and religion. His magnificent voice and noble presence greatly helped his great oratorical powers. In 1870 he pub. his collection of poems, *Digte og Sange* (new ed. 1880), and his epic, *Arnljot Gelline*. His political enthusiasm kept him for a time from literature. From 1873-76 he lived abroad, and did not return to Norway till 1877. His third literary period may be dated from now on; it is marked by a complete change, and B. takes his place with Ibsen as one of the pioneers of modern drama with a direct appeal to life as it is actually lived, and with a close insight into the motives of everyday action. These plays were at first unsuccessful, though they excited much controversy; they include *En Fallit* (A Bankruptcy); *Redaktören* (The Editor), 1874; *Kongen* (The King), 1877; *Leonarda; Det ny System* (The New System), 1879; *En Hanske* (The Gauntlet), 1883; and *Geografi og Kærlighed* (Geography and Love), 1885. His symbolic play, *Over Evne* (Beyond our Powers), was pub. 1883, but not produced till 1899. In the political crisis over the royal veto he supported Sverdrup with his old vehemence, and for a time he lived abroad and wrote the analytical and psychological novels, dealing with heredity and education, *Det Flager*, etc. (Flags are Flying), 1884; *Paa Gud's Veje* (In God's Way), 1890. A collection of powerful stories (*Nye Fortællinger*) was pub. in 1894. His later work includes the plays: *Paul Lange*, 1898; *Laboremus*, 1901; *At Storhove*, 1904; *Daglannet*, 1904; *Naar den ny Vin Blomstrer*, 1909. He received the Nobel prize for literature in 1903. Though an ardent nationalist he adopted a moderate policy during the rupture between Norway and Sweden, and strongly opposed the proposal of a new Norwegian language based on the peasant dialects, the *Bonde-Maal*. *See* C. Collin, *Björnson*, 1903; W. Payne, *Life*, 1910; E. Gosse, *The Novels* (13 trans. and Memoir), 1895; G. Brandes, *Critical Studies*, 1899. There is a short memoir and full bibliography by R. F. Sharp in *Three Comedies by Björnson* (Everyman's Library).

Björnstjerna, Magnus Frederik, Count (1779-1847), Swedish diplomatist, was born at Dresden; he joined the army and fought against the Fr. at the Battle of Leipzig, and later served in Holstein. In 1814 he signed the treaty uniting Sweden and Norway. He was minister plenipotentiary to Great Britain from 1828-46. He wrote books on *Hindu Theogony*, 1843, and on the British rule in India. He died at Stockholm.

Black, Adam (1784-1874), Scottish publisher, born in Edinburgh; learnt the business of bookselling in London and Edinburgh, and started for himself in Edinburgh, where by 1826 he had reached a leading 'position.' In conjunction with his nephew Charles Black, he estab. the still existing publishing house of A. and C. Black. He took a keen part in municipal politics, and was twice Lord Provost of Edinburgh, and was member for the city from 1856 to 1865 as a Liberal. He retired from business in 1865. In 1895 the firm was removed to London. The chief events of the history of the house were the issue of the 7th, 8th, and 9th eds. of the *Ency. Brit.*, the copyright of which had been purchased from Constable in 1827; and the purchase from Cadell of the copyright of Scott's Waverley Novels in 1851, and of De

Quincey's works in 1861. *See* Memoir, by A. Nicholson, 2nd edition 1885.

Black, John (1783-1855), Scottish journalist, became a parliamentary reporter in 1810, and in 1817 editor of the London *Morning Chronicle*. In this position he quarrelled and fought a duel with Roebuck in 1835. During his editorship, from which he retired in 1843, Dickens began his career as a parliamentary reporter. He trans. many works from Ger., It., and Fr., and pub. a *Life of Tasso*, 1810.

Black, Joseph (1728-99), a Scottish physicist, born in France; after an education in Belfast, studied medicine and chemistry under Professor William Cullen, whom he succeeded in 1756 as professor of anatomy and chemistry, a position he later exchanged for the chair of medicine. His chief chemical work includes the discovery of 'fixed air,' Lavoisier's carbonic acid, and his statement of the doctrine of 'latent heat;' the first was of great importance in the study of the chemistry of gases, the second in the study of steam and the evolution of the steam engine. In 1766 he became professor of chemistry at Edinburgh, where he died. *See* his biography prefixed to the ed. of his *Lectures on the Elements of Chemistry*, by Prof. J. Robison, 1803.

Black, William (1841-1898), novelist, born in Glasgow: studied art with little success, and became a journalist, writing for the *Morning Star*, for which he acted as war-correspondent during the Austrian and Prussian war of 1866; he then joined the staff of the *Daily News*. His first novels, *James Merle*, 1864, and *Love and Marriage*, 1868, made no mark, but the publication of *In Silk Attire*, 1869, and *Kilmeny*, 1870, were distinctly successful; his great popularity, however, as a novelist, which lasted till his death, may be dated from *A Daughter of Heth*, 1871. B.'s special power was that of vivid description of scenery and outdoor life, especially among Scottish mts. and on the sea off the coast of Scotland, combined with an easy and charming narrative style. His long series of novels include *The Strange Adventures of a Phaeton*, 1872; *A Princess of Thule*, 1874; *Madcap Violet*, 1876; *Macleod of Dare*, 1878; *White Wings*, 1880; *Shandon Bells*, 1883; *White Heather*, 1885; *In Far Lochaber*, 1888; *Stand Fast, Craig Royston*, 1890; *Highland Cousins*, 1894; *Briseis*, 1896; and *Wild Eelin*, 1898. He was an enthusiastic fisherman and yachtsman. A lighthouse was built to his memory at Duart Point, Sound of Mull, in 1901. He also wrote a *Life of Oliver Goldsmith* (Eng. Men of Letters Series), 1878. *See* Life by Wemyss Reid, 1902.

Black Acts, the name applied to (1) the statutes of the Scottish parl., 1424-1594, which were printed in black-letter; (2) to the Scottish Acts of 1584, passed at the instigation of James VI., to suppress Presbyterianism and re-establish Episcopacy. These acts declared the supremacy of the king, overthrew the jurisdiction of the kirk; the functions of the presbyteries and assembly were handed over to the bishops; it was made treason to attack episcopacy. The acts were abrogated in 1592. (3) An outbreak of outrages and robberies, etc., committed by gangs of men with blackened faces, led to the passing of an act, 1722, making the offence a felony; the act was popularly known as the Black Act; it was repealed 1827.

Blackadder, John (1615-86), a Scottish divine and member of a family whose ancestors were renowned in Scottish history. He studied at Glasgow and became distinguished in Latin, Greek, and Oriental languages. He took his M.A. in 1650, and was made minister of Troqueer in Galloway in 1652. He was imprisoned for preaching to conventicles, and later on outlawed. He took refuge in Rotterdam in 1678, but upon his return he was again captured and sent to the Bass Rock, where he died.

Blackadder, John (1664-1729), the younger, lieutenant-colonel of the Cameronian regiment, served with his regiment during the Highland rebellion, took part in the campaigns of the Prince of Orange in Flanders (till 1697), and, as captain, assisted at many of Marlborough's victories, but sold his commission before the treaty of Utrecht. The remainder of his life, passed at Edinburgh and Stirling, was devoted to ecclesiastical affairs. The Calvinistic convictions of his youth had been confirmed by his philosophical studies at Edinburgh University.

Black Agnes (so called from her complexion), Countess of March, defended Dunbar Castle against Montague, Earl of Salisbury, in 1338, for five months, until reinforcements having reached her by sea, the Eng. withdrew. The incidents of the siege make the story one of the most picturesque in Scottish history.

Black and White, an illustrated weekly, founded in 1891 by Mr. Charles Norris Williamson, and forming from the first a powerful rival to its predecessors, the *Illustrated London News*, and the *Graphic*. Beginning as an artistic journal, it soon became one of the pioneers in photographic illustration of current events, and now publishes both drawings and photographs dealing with news and

interesting personalities. The literary matter includes short illustrated stories and articles on politics, society, sport, and professional subjects. The editors have included Mr. J. Nichol Dunn and Dr. M'Kew, while among the literary contributors were Swinburne, Bret Harte, Kipling, Stevenson, and Barry Pain. Herkomer, G. F. Watts, Max Cowper, and Linley Sambourne have contributed on the artistic side.

Black Art, *see* MAGIC.

Black Assizes, the name given to certain 'assizes' at which a very virulent and widespread epidemic of gaol fever, or typhus, broke out; more particularly to one which occurred at the close of the Oxford assizes, July 1577, of which more than 300 persons died, including the high sheriff and many officials of the court.

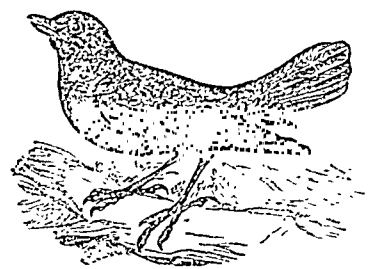
Black-band Ironstone, in mining and metallurgy, an iron-ore 'siderite,' found chiefly in Scotland; it is a carbonate of iron, mixed with a large proportion of coal or bituminous matter. It is of intensely black colour, and was highly prized for its ease in smelting.



BLACKBERRY

Blackberry, or *Rubus fruticosus*, is a species of Rosaceæ which has many varieties in Britain. The plant is a hook-climber, and frequently roots where the branches touch the earth, thus forming a new plant. The fruit grows on a flattened thalamus with a conical protuberance on which are borne many one-seeded drupelets; it therefore consists of an etærio of drupes, and is not properly a berry. It is also commonly called bramble.

Blackbird (*Turdus merula*), the name of a common bird, found all over Europe, in Asia, and N. Africa. It has been acclimatised in New Zealand. In Great Britain it is a resident, but large numbers of emigrants also come in the autumn. The male is entirely black, with bright yellow beak, taking a deeper and more vivid colour in the breeding season. The female is of



RING BLACKBIRD

a dusky brown, fading to a paler hue beneath. The nest, built in thickets or creeper-clad trees, is of grass and moss, and plastered with mud; the eggs, four to six in number, are blue with brown specks. The B. is a fine song-bird, its notes being clear and loud, but it has not the range or modulations of the thrush. Destructive to fruit and seeds, it also feeds largely on worms, grubs, snails, and is therefore useful in keeping down garden pests. Its old Eng. name 'ousel,' appears in the name of a variant, the 'ring-ousel,' so called from its white neck marks. It is a rare visitor to Great Britain.

Blackbirds, Field of, or **Kossovo Polje**, a small plain in European Turkey, lying to the S. of Pristina. It is famous as the scene of two great battles: (1) The victory of Sultan Murad over the Servians, whose emperor, Lazar, was killed, and whose empire was overthrown, in 1389. (2) The victory of Sultan Murad II. and George Brancovics of Servia over John Hunyady of Hungary in 1448.

Black Book: 1. Of the Admiralty, contains, under the title of 'Laws of Oléron,' the earliest collection of 'sea laws,' dating back to the 14th century. It was first ed. by Sir Travers Twiss, 1871-76, and embraces the various maritime laws and customs on which the judge in the Admiralty Court bases his decisions. 2. Of the Exchequer, is a meagre record of the royal household in Henry II.'s reign.

3. Of the Household, is a similar record to (2), compiled in Edward IV.'s reign. 4. The term B. B. was also applied to the reports, the accusations of which are for the most part unfounded or extravagant, presented to parliament in 1536, upon which were based the laws for the dissolution of the monasteries.

Black Bulb Thermometer, a maximum thermometer the bulb and part of the stem of which are coated with lampblack and which is enclosed in a vacuous cylinder. It thus provides a delicate instrument for the measurement of temperature by radiation only, and if placed in open sunshine and compared with the readings of a delicate thermometer in the shade, gives an indication of the difference of temperature due to direct solar radiation.

Blackburn, a tn., Lancashire, England, 24½ m. N.N.W. of Manchester, 9 m. E. of Preston. It is a municipal co. and parl. bor., returning two membe[illegible] in a valley, [illegible]ing 700 to [illegible] one of the [illegible] industry of Lancashire, the weaving of goods used for expo[illegible] being a special feature. T[illegible] 40,000 cotton operative[illegible] 75,000 looms and over 1,300,000 spindles. There is a considerable iron and machinery industry, but the old 17th century woollen trade, when B. was famous for its 'checks' and 'greys,' has long disappeared. James Hargreaves, the inventor of the spinning jenny, was a native, and his employer, grandfather of Sir Robert Peel, greatly fostered the growth of the cotton industry. The tn. was incorporated in 1851, and was made a co. bor. in 1888. The Elizabethan Grammar School is in modern buildings. There are fine parks, Queen's Park and Corporation Park. St. Mary's Church is a very anct. foundation, and the building dates from 1826. Pop. (1901) 127,626. *See* Abram, *Hist. of Blackburn*, 1897.

Blackburn, Colin, Baron (1813-96), a noted judge, was born in Selkirk, Scotland. In 1838 he was called to the bar, and he became a judge in the Court of Queen's Bench in 1859. The year following he received a knighthood, and in 1876 he was made a life peer and a lord of appeal. His *Contract of Sales* was pub. in 1845.

Blackburne, Francis (1782-1867), Lord Chancellor of Ireland, born in co. Meath; educated at Trinity College, Dublin; called to the Eng. bar, 1805, and to the Irish bar, 1822, when he was employed in repressing disorder in Limerick under the Insurrection Act. He was Attorney-General for Ireland, 1830 and 1841; Master of the Rolls, 1842; Chief Justice of the Queen's Bench, 1846 (in this capacity he presided at the trial of Smith O'Brien); and Lord Chancellor, 1852; in 1856 he was made a Lord Justice of Appeal. In 1866 he again became Lord Chancellor.

Blackburne, Lancelot, Archbishop of York (1658-1743). He was educated at Westminster School, afterwards entering Christchurch, Oxford, in 1676. His rise in the church was due originally to Bishop Trelawney. His disposition was gay, and his manner witty. A certain freedom from the restraint usually observed by the clergy caused many fables to be circulated regarding his 'licentiousness.'

Black Cap, a cap which is worn by the judges of Great Britain when a sentence of death is to be delivered to a prisoner.

[illegible]

The general colour of the bird is an ashen grey, turning to an olive brown above and pale or whitish grey below. The cock-bird alone has the jet-black cap which gives the name, the hen's [illegible]ing brown. It is one [illegible] song-birds. It leaves [illegible] the end of summer.

Black-capped Tomtit, or Titmouse, is the *Parusatricapillus* of N. America, known locally as the chickadee. It belongs to the Paridæ family, is small but strongly built, has a sharp black bill, and in colour varies between black, white, grey, and yellowish-grey. The British marsh titmouse, or *P. palustris*, is sometimes given this name.

Blackcock and Heathcock are names often applied to both sexes of the black grouse, *Tetrao* or *Lyrurus tetrix*, though *greyhen* is a more suitable designation of the female. They are allied to the quail, partridge, and capercailzie, and are common in N. Scotland. The food consists of buds, young shoots, berries, and insects. The plumage of the male is very beautiful, the tail is lyrate, and above the eyes is a piece of bright red skin which becomes more intense during the pairing season. The bird is polygamous, and in the spring the males attract the females by curious crowings and noises as of the whetting of a scythe.

Black Country, The, is a term used to denote the mining and manufacturing district situated partly in the S. of Staffordshire and partly in Warwickshire. It is so named from the numerous factories and coal mines around. The manuf. of iron in all its branches is very largely carried on, and the chief smelting centres are

Wolverhampton, Dudley, Wednesbury, W. Bromwich, Walsall, Bilston, and Tipton, while Birmingham is the great central market.

Black Death is the name of a terrible pestilence which was pandemic in the 14th century. Though there were outbreaks in 1361-2 and 1369, its worst visitation was in 1348. Beginning in China—it was probably a form of the Oriental plague—it reached the coast towns of Italy through Constantinople, and thence spread all over Europe. Its symptoms were blood-spitting, putrid pulmonary inflammation, and black spots and tumours on thighs and arms. The victim usually succumbed a few days after the appearance of the boils. The death-rate, though phenomenal, cannot be estimated, there being no scientific record of births and deaths. It is believed that 37,000,000 perished in the East, whilst in England alone, of the British Isles, something like 1,500,000, that is, between one-third and a half of the entire population, were mortally affected. It is said that the advent of the contagion was preceded by ominous portents—famine, drought, earthquake, dense fog, and seasonal disturbance. As in the plague at Athens, the ravages of the scourge led to wild outbursts of more often to and debauchery. Mothers deserted their stricken children, and the sick were left to die and rot in public highways. The enormous mortality is a landmark in Eng. economic history. Laws were futile to interfere with the rapid rise in wages, engendered by the scarcity of labour, whilst Wat Tyler's rebellion is only one outward indication of the far-reaching and inevitable changes that resulted in the relation between landlord and peasant.

Black Earth (Russian *tschernozom*), a particular kind of loess, forming a rich black soil, containing a large proportion of humus, found stretching over a vast area of Russia, from the Carpathians to the Ural Mts., and occupying some 150,000,000 ac. Its depth varies from a few ft. to 7 or 8 ft. It is wonderfully fertile, bearing abundant grain crops for many consecutive years without manure.

Blackfeet, the Eng. name given to a tribe and to a confederacy of N. American Indians, either as a translation of a native word, or, according to tradition, from the smoke-blackened mocassins of a tribe first met by the whites. The native name of the tribe is Siksika. The confederacy was formed of the Piegans, the Kinos or Bloods, and the Siksika or B. proper. All are of Algonkian stock. The confederacy was once the strongest Indian power in the N.W., and extended from the Rocky Mts. to the head waters of the Missouri, and into what is now Alberta and Saskatchewan. At the present day the tribes number about 4500, the Piegans about 2000 in B. reservation in Montana, 400 in Alberta; Bloods, 1100, chiefly in Alberta; and Siksika or B. proper some 800, chiefly in Alberta. An epidemic of smallpox decimated the tribes in the middle of the 19th century. *See* Maclean, *Canadian Savage Folk*, 1890; Grinnell, *Blackfoot Lodge Tales*, 1903; and *Handbook of American Indians*, Washington, 1907; and a *Siksika*.

Black-fish: 1. *Dallia pectoralis*. In Alaska what is known as the B. belongs to the genus *Dallia*, characterised by a very thin skeleton and by the dorsal fin being far back—in the latter way resembling a pike. The scales are very small and embedded in the skin. It is a fresh-water fish, and is used for food by the people in some parts of Alaska. 2. *Centrolophus niger*, belonging to the Stromateidæ. This fish, something like a perch, has very small cycloid scales which are deciduous. The species of this family are widely distributed, and this particular species has been found on the coasts of England. The name is also given to other varieties of dark coloured fishes.

Black Flux, a mixture used in the reducing of certain ores. It consists of powdered carbon and potassium carbonate, and is usually prepared by heating crude cream of tartar or argol with half its weight of nitre.

Black Forest (Ger. *Schwarzwald*), a thickly-wooded mountainous dist. of S.W. Germany, running on the E. side of the Rhine valley, which bounds it from Basel on the S. It extends to the Neckar Valley on the N. Two-thirds of the dist. lies in the grand duchy of Baden, on the W., the remainder in the kingdom of Würtemberg, on the E. Its area is about 1800 sq. m., its length 100 m., greatest breadth 36 m. The southern portion is the wildest and most mountainous, containing the highest peaks, Feldberg, 4898 ft.; Herzogenhorn, 4600 ft.; Blössling, 4260 ft. The Kaiserstuhl (Emperor's Chair) is an independent group of volcanic origin, 10 m. long, 5 m. broad; the highest point being 1760 ft. The valley of the Kinzig divides the southern from the lower northern portion. The forests of the dist. consist mainly of spruce, silver fir, Scotch pine, on the higher slopes, with birches, beech, and oak below. The former large trade in logs floated down the Rhine has decreased, as most of the timber is consumed in the dist., especially in the manuf. of wood pulp, and also in the long estab.

industry of toys, wooden clocks, and musical instruments, etc. There are many mineral springs, those of Baden-Baden and Wildbad being the best known. The principal tns., Freiburg, Rastatt, Offenburg, Lahr, lie along the W. border. As a touring resort the B. F. has long been famous for its beautiful valleys, picturesque wooded heights and mountain and forest lakes.

Black Friars, *see* DOMINICANS.

Blackfriars Bridge, a bridge over the Thames, London, England, next below Waterloo Bridge, and above Southwark Bridge, the railway bridges for Blackfriars and Cannon Street stations intervening between the two last. B. B. was begun in 1865 and opened in 1869, from designs by J. Cubitt. It was widened for the London County Council electric tramway along the Embankment to Westminster Bridge in 1907-9. The name commemorates the monastery of the [illegible]

Blackguard was a term much in use during the 16th century. It designated certain soldiers and camp followers. It also meant the lowest servants of a nobleman's household, *who performed the dirtiest and* blackest work in the kitchens.

Black Hand, a mysterious society, existing among the Its. in New York, for purposes of blackmail and extortion. *It is said that 30,000 men live by* B. H. crime. The police appear to be powerless against the Black Handers, who never fail to revenge refusal or exposure on the part of a victim. This revenge consists in stabbing, revolver shots, bombs, incendiarism, and child kidnapping. The Black Handers sign their letters of threat with a picture of a black hand clutching a dagger.

Black Hawk, an American Indian chief who took part in the war of 1812 against the Americans. He was finally defeated in the Black Hawk War, 1832, after many times to agree to treaties made to that his tribes should relinq lands. After being releas Fortress Monroe, B. H. s Iowa, where he died.

Blackheath, an open common and a residential district belonging to the metropolitan bor. of Lewisham, in the S.E. of London. The common, once about 260 ac. in extent, but now reduced to 70 ac. by building encroachments, lies S. of Greenwich Park. On the S. of the common is Morden's College, founded by Sir John Morden at the end of the 16th century as an almshouse or pensionary for Turkey merchants. The heath was the scene of the rebellious gatherings of Wat Tyler (1381) and Jack Cade (1450). The Cornish rebellion led by Lord Audley was crushed in a battle on B. in 1497, and here the people met Henry V. after Agincourt and the army Charles II. at the Restoration. Golf was certainly played on B. common earlier than elsewhere in England, tradition dating its introduction to 1608 and to James I. The Blackheath Rugby Football Club and its ground, the Rectory Field, is famous.

Black Hills, a mt. system S.W. of S. Dakota, and N.E. of Wyoming, U.S.A. The area covered by the hills is about 9000 sq. m., and the highest point, Harney Peak, attains an alt. of 7403 ft. Large forests of pine and other coniferous trees cover their slopes. Among the minerals deposited there are gold, carboniferous limestone of good quality, and lead. Two branches of the R. Cheyenne encompass the area. The fertility of the valleys renders dairy produce most successful.

Black Hole of Calcutta, the popular name given to an atrocity perpetrated by Suraj-ud-Dowlah, Nawab of Bengal, during the Seven Years' War. When he sacked Calcutta and seized Fort William in 1756, *most of the Eng. residents escaped, but some* few, und [illegible]olwell, remainec [illegible] surrender [illegible]native prince. [illegible] were [illegible] chamber, 18 ft. [illegible] small windows [illegible]illing summer's night, and next morning 23 alone of the 146 prisoners staggered out, or were carried out, alive. In 1902 Lord Curzon dedicated a monument in memory of the incident, the site of which is now marked by a marble slab. A vivid account of this act of barbarism which was avenged by the victory at Plassey in 1757, will be found in Lord Macaulay's *Life of Clive.*

[illegible] John Stuart (1809-95), a ter and scholar, born Studied at the Mariscl Aberdeen, Edinburgh 825-6, and in Germany at Berlin and Göttingen. In 1834 he was admitted to the Faculty of Advocates, but devoted himself to Eng. literature and to classics. He was professor of humanity (Latin) at Aberdeen from 1841 to 1852, when he became professor of Gk. at Edinburgh University, a chair he held till 1882. His lectures were extraordinarily successful, especially in arousing a new enthusiasm for the classics; he took a prominent part in educational reform and the remodelling of Scottish

universities. His literary output was great, and he threw himself with ardour into such subjects as the study of modern Gk.; he was largely instrumental in the founding of a professorship of Celtic at Edinburgh University, and the grievances of the Highland crofters, and all questions of Highland and Scottish nationality and customs drew his enthusiastic support. In politics he was a stalwart independent Radical. His picturesque figure and dress was familiar to every one in Edinburgh. His writings include translations of *Faust*, 1834; *Æschylus*, 1850; and the *Iliad*, 1866; *Homer and the Iliad*, 1866; *Four Phases of Morals*, 1871; *Horæ Hellenicæ*, 18[illegible] *Literature of th[illegible]* 1876; *Scottish [illegible] Land Laws*, 1885; *Wisdom of Goethe*, 1883; *Life of Burns*, 1888; *Scottish Song*, 1889; *Christianity and the Ideal of Humanity*, 1893; and sev. vols. of verse, original and translations. *See* A. M. Stoddart, *J. S. Blackie*, 1895; A. S. Walker, *Selected Poems*, 1896; H. A. Kennedy, *Professor Blackie*, 1895.

Blacking, a mixture applied to leather, especially that of boots and shoes, in order to produce a polished brilliant black surface. It consists of powdered bone-black, raw sugar or molasses, sulphuric acid, and vinegar. B. is either made up in a semi-liquid form or more usually now in the form of a paste. Day and Martin's B. in stoneware bottles has long been famous. For harness leather the chief foundation is bees'-wax mixed with turpentine, ivory black, and copal varnish.

Black Isle, a peninsula on the E. of Ross and Cromarty, Scotland; it lies between Cromarty Firth, N., and Beauly and Inverness Firths, S. and S.E.; on the N.E. and E. it projects into Moray Firth. It has a coast-line of 52 m. The Highland R. runs from Muir of Ord to Fortrose. The prin. tns. are Cromarty and Fortrose. The soil is fertile; the highest point of the Mulbuie ridge is 838 ft.

Black-lead, Plumbago, or Graphite, a mineral crystallising in the rhombohedral system. It is usually found in six-sided tabular crystals, black or dark steel-grey in colour, greasy to the touch, and with a hardness of 1. Chemically it consists of carbon with impurities of iron sesquioxide and clay. It resists chemical change more than other forms of carbon, fusing only in the electric arc, and is unaltered by most acids. It is a good conductor of electricity, and is so soft that it marks anything it touches: hence its use for the manufacture of writing pencils and as a polish for ironwork. Its greasy nature makes it an excellent dry lubricant for the breech-locks of rifles, etc., where a volatile lubricant is not desirable. Graphite is found in beds and embedded masses, scales, or leaflets in granite, gneiss, mica schist, and crystalline limestone. It occurs amongst slate in Cumberland and gneiss in Scotland; quantities are exported from Ceylon, and that found at Irkutsk in Eastern Siberia is probably the best in the world. America is supplied by beds at Ticonderoga in N. Carolina, and at Sonora in Mexico. It is artificially produced in iron furnaces and is produced electrically from anthracite for the manufacture of black-lead pencils.

Black Letter, the name given to a type used in the earliest printed books, sometimes used widely as equivalent to 'Gothic,' sometimes confined to the early English types used by Caxton, in which case it is also styled 'English type.' The words following are printed in modern black letter, which is used in ornamental printing and for captions, headlines, titles, etc. Early types were copied from the handwriting in use at the time, and thus the German script was adopted. Gothic or B. L. was used extensively all over Europe in various forms and modifications. It was succeeded by the It. or Rom. type, founded on the purer and simpler It. or Rom. script of the 12th century, but it long remained in use for printing bibles, law-books, proclamations, and the like. B. L., or rather a modification, is still the national Ger. type of printing, but there is a growing movement to print more books in Germany in Rom. type. In old church calendars the greater festivals and saints' days were marked by being printed in red ('red-letter days'), the lesser days were printed in black ('black-letter days'), hence the term came to be applied to unlucky, inauspicious days.

Black List: 1. The name given to a printed list issued to subscribers by various trade protection societies, which gives the names of those whose credit is bad, thus serving as a warning against allowing them to incur fresh debts. Such lists are made up from judicial and other various sources, and include the records of bankruptcies, arrangements or compositions with creditors, unsatisfied judgments for debts, bills of sale, liquidations, warrants of attorney, dissolution of partnership, and all matters of public record that affect the financial standing of the parties named in the list. 2. The *Licensing* Act of 1902 provided that when a person had been convicted of the offence of habitual drunkenness, he

should not for three years obtain liquor from any publican or licensed club, and that the police should keep a list, popularly styled the B. L., of such convictions in the area of the court where such convictions were recorded. It is believed that this regulation has become a dead letter.

Blacklock, Thomas (1721-91), Scottish poet, born at Annan, Dumfriesshire, of humble parentage, lost his sight through small-pox when six months old. Some early poems which he wrote, first pub. in 1746, led to his educatio[illegible]e he studied early admirer and persuaded him to abandon his leaving Scotland for the W. Indies. He supported himself by taking pupils in Edinburgh. *See* H. Mackenzie's edition of poems with Life, 1793.

***Blackmail**, a legal term, has had* three distinct meanings: 1. It once referred to rent paid in labour, corn, or baser metal (reditus nigri), so called to distinguish it from silver money (mailles blanches). 2. In the border country between England and Scotland it meant tribute in coin or cattle, extorted from farmers by moss troopers, as a guarantee of immunity from raids. Though this custom was made a felony in 1601, it continued till the union of the two countries in 1707. 3. Extortion of money or goods on threat of libel, exposure, or prosecution is the modern signification of the word.

Black Monday was Easter Monday 1360, when a storm of terrible violence occurred. Shakespeare mentions the event in *Merchant of Venice*, ii.5-25.

[illegible] Sir Richard (c. 1650-[illegible]ysician and [illegible]am, Wilts.; [illegible]then studied in Lo[illegible]

Supporting the revolution he knighted, 1697, and became [illegible] physician to William III. an[illegible] Queen Anne. He was a voluminous writer of dull and turgid epics, which merit the ridicule of Pope's *Dunciad*, though they were praised by Addison, and one was thought worthy by Johnson of appearing in his collection of the British poets. Of his six epics, in sixty books, the *Creation*, 1712, expounding Locke's philosophy as against the infidelity of Hobbes, was the most praised.

Blackmore, Richard Doddridge (1825-1900), an Eng. novelist, born at [illegible] educated [illegible]on. He [illegible]ised [illegible] health. He then [illegible] and market-[illegible] His first pub. work, poems, was not successful, but his first novel, *Clara Vaughan*, 1864, was at once welcomed. In 1869 was pub. his greatest and most successful work, *Lorna Doone*, which marked the rise of a new romanticism. Its stirring plot, its charming heroine, and its sturdy, manly hero, Jan Ridd, the wild doings of the marauding Doones, and above all its masterly and exquisite realisations of Exmoor scenery and of old Devonshire manners and customs, make the novel a classic in its way. Its popularity has called for constant new eds. B.'s next novel, and perhaps his best after *Lorna Doone*, was *The Maid of Sker*, 1872. His other novels include: *Cradock Nowell*, 1866; *Cripps the Carrier*, 1876; *Christowell*, 1880; *Springhaven*, 1887; *Perlycross*, 1894; *Tales from the Telling House*, 1896; *Dariel*, 1897.

***Black Mountains**, a group of mts.* W. of N. Carolina, U.S.A. Most of the area is situated in the co. of Yancey. Of the Appalachian system they are the highest mts. Its chief peak is Clingman's Peak (6707 ft.). Firs abound on their slopes.

Blackness, a Scottish vil. of the co. of Linlithgow. It is situated on the Firth of Forth, 3½ m. from Bo'ness.

Blackpool, a municipal bor. (1876), co. bor. (1904), and popular watering-place, Lancashire, England, 46 m. N. of Liverpool and 8 m. S.W. of Fleetwood, on the Irish Sea between the mouth of the Ribble and Morecambe Bay. B. is one of the most popular of seaside resorts in the N. of England, attracting large crowds of excursionists, especially from the [illegible] of Lancashire and [illegible] air, fine sands, [illegible]nced by a 3 m. [illegible]piers, theatres, concert and dancing halls, winter [illegible]ium, an Eiffel Tower [illegible]igh, and many other [illegible]p (1901) 47,346.

[illegible] the second Eng. iron-clad (9210 tons, 13·6 knots, 40 guns, heaviest 68-pounders), was launched in 1861. Another B. P., armoured cruiser (13,550 tons, 22·3 knots), was launched in 1901 by the Thames Shipbuilding Co. The first B. P. in the Eng. navy ser[illegible] and was driv[illegible]

Black Prince, the [illegible] name by which Edward, Prince of Wales, eldest son of Edward I., King of England, is commonly known. He was born at Woodstock, June 15; made Earl of Chester, 1337, Duke of Cornwall, 1337, created Prince of Wales, 1343. His military career began with the Fr. campaign of 1346, and he distinguished himself at Crecy and at the siege of Calais. He was one of the original knights of the Garter and

was present at the naval battle off Winchelsea with the Spaniards in 1350. In 1355, as lieutenant for his father in Gascony, he reconquered for England much ter. in the S., and made many marauding expeditions, and in 1356 won the great victory of Poitiers, showing himself a master of tactics, and returning in triumph to London with King John a prisoner in his train. He took part in the expedition to France in 1359 which ended in the peace of Calais, 1360. In 1361 he married Joan, Countess of Kent, his cousin, and in 1362 was made Duke of Aquitaine, where he ruled as a vassal sovereign. In 1367 he lent his aid to Pedro the Cruel, deposed King of Castile, led his army into Spain, and defeated the usurper Henry of Trastamare and Bertrand du Guesclin at Najera. The expedition ruined him in health and resources, and on his return began the revolt of his vassal barons. He was too ill to suppress the revolt, and the military capacities of John of Gaunt were poor. His dominions shrank, and after the cruel and useless sack of Limoges, 1370, he returned to England, resigning his dukedom in 1372. He was buried in Canterbury in the great tomb with his arms above, which still remains. His name of Black Prince cannot be traced earlier than the 16th century, tradition makes it due to his black armour. *See* J. Moisant, *Le Prince Noir en Aquitaine*, 1894; R. P. Dunn-Pattison, *The Black Prince*, 1910; and Rev. W. Hunt's biography in *Dict. of Nat. Biography*.

Black River, a riv. of N. York, U.S.A. It forms the boundary between the counties of Hamilton and Herkimer, and empties itself in Lake Ontario. Its length is 200 m.

Blackrock, the largest of the suburbs of Dublin, Ireland. It has 8089 inhab. and is a favourite seaside resort.

Black Rod, an official of the British House of Lords, the full style being the 'Gentleman Usher of the Black Rod.' The name is derived from his staff, the insignia of his office, an ebony rod topped with a golden lion. The office dates from 1350. B. R is also the first usher of the court and the kingdom, and as such takes part in all court and other ceremonials; he is also the prin. usher of the Order of the Garter, and as such his duties include the guarding of the door at a chapter of the knights. His duties as an official of the House of Lords are the most important; they correspond to those of the Sergeant-at-Arms in the House of Commons. He maintains order and has the power to arrest a peer for breach of privilege of the House or other offences noticed by the House. He is the official messenger from that House to the House of Commons. These duties are performed personally or by his deputy, the 'Yeoman Usher of the Black Rod.' Certain formalities and ceremonies are observed, interesting as dating from the attempt of Charles I. to arrest the five members in 1642 and as signifying the right of the Lower House to freedom of debate and security from interruption. When the House of Commons are summoned to the House of Lords to hear the King's speech from the throne or to attend at the giving of the royal assent to bills, B. R. has to summon their attendance; at his approach the doors are closed upon him; he knocks thrice and announces his presence. On his admittance he addresses the Speaker, and if the King is present in person, the message is that 'the King commands the presence of the honourable House;' if he is represented by commissioners, then the word used is 'desires.' The office of B. R. is held by a distinguished military or naval officer; the salary is £1000 a year.

Black Sea, or Euxine (anct. *Pontus Euxinus*, Turk. *Kara Dengis*), an inland sea situated between Eastern Europe and Asia Minor, bounded on the N. and E. by Russia, on the W. by Roumania, Bulgaria, and Turkey, on the S. by Asia Minor. Its greatest length is about 720 m., and the greatest breadth 380 m. The total area is about 170,000 sq. m. By the Strait of Yenikale it communicates with the Sea of Azov on the N., and by the Bosphorus, Sea of Marmora, and the Dardanelles with the Mediterranean. On the N.E., E., and S.W. the coast is high, and flat on the N. and N.W. Its maximum depth reaches the prodigious figure of over 7000 ft., the 100-fathom line running close to the shores, except on the E. and W. of the Crimean peninsula. The salinity of the water is on the average only half that of the ocean, a fact due to the enormous body of fresh water poured in by the large rivers, such as the Danube, Dniester, Bug, Dnieper, Kuban, Rion, Kizil-Irmak, and Sakaria. There is a strong surface-flow out through the Bosphorus, and a deeper inward flow from the same direction. The strong currents, sudden and frequent storms, fogs, and occasional drift-ice sometimes render the navigation of the sea in winter a matter of considerable difficulty, though the dangers have at times been considerably overestimated. There is no perceptible tide. The deeper waters are apparently devoid of organic life, the higher forms not being known to

exist below 100 fathoms. The chief ports on the sea are Poti, Odessa, Batum (which by means of the railway to Baku serves as a point of connection between the B.S. and the Caspian), Nikolaiev, Kustendji, Sulina, Kherson, Eupatoria, Kertch, Sevastopol, and Trebizond. There are no islands of importance. By the treaty of Paris (1856) the sea was closed to all ships of war This provision, however, was abrogated in 1871, and Russia and Turkey both have fleets in its waters.

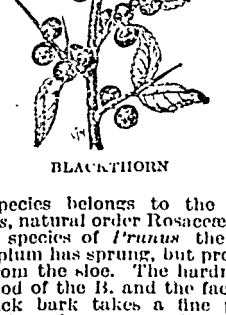
Black Sea Government, or Tchernomorsk, ter. of Transcaucasia, Russia. The dist. is a narrow strip of land lying between the coast of the Black Sea and the western slope of the Caucasus Mts. Cap. Novorossysk. Area, 2836 sq. m.; pop. 54,228.

Black Snake, or *Zamenis constrictor*, a harmless, non-poisonous ophidian reptile of the family Colubridæ. It is a slender snake, and the male is smaller than the female; the largest specimen does not exceed 6 ft. in length. The colour is usually a dark shining black above, slate-grey beneath, with white markings, and a black tongue, but some of these animals are pale green and yellow, and are called *green racers*. The snake can swim extremely well, move swiftly on the ground, and climb lofty trees, and on all its expeditions can find food, as it devours frogs, toads, mice, smaller snakes, insects, birds, and eggs. It inhabits both North and South America.

Blackstone, a tn. of Massachusetts, U.S.A., on the Blackstone R., 23 m. S.E. of Worcester; pop. 6100.

Blackstone, Sir William (1723-80), commentator on Eng. law, born in London, was educated at the Charterhouse and Pembroke College, Oxford; entered at the Middle Temple, 1741, and was made fellow of All Souls, 1744. In 1749 he became recorder of Wallingford. In 1753 he abandoned his legal practice and returned to Oxford to college duties and lecturing to pupils. In 1758 he became the first Vinerian professor of law, and read the first of his lectures to the university; their success led to much copying and a pirated ed., and in 1765 he pub. the first vol. of the *Commentaries on the Laws of England*, and the four vols. were completed and pub. in 1769. The reputation which he thus made drew him back to practise and public life. He was member of parliament for Hindon, and later for Westbury, and in 1770 was made a judge of the Court of Common Pleas. B. made no mark as a judge, nor are his miscellaneous writings of value; his fame rests upon his *Commentaries* alone. Apart from any merits or demerits, they stand alone not only as the indispensable text-book for lawyers for nearly a century, but also as the groundwork or model on which the body of Eng. law was built up in America and the British colonies. Written in a clear and, above all, a readable style, it gave the first clear picture of Eng. law as a whole. It has permeated the whole idea of law for the ordinary man, and for long was treated with as much respect as if its text contained a final legal decision to which all must bow. Historians and jurists have broken the false position in which it was placed, but it must be remembered that the author aimed only at what he succeeded in achieving, an admirable and lucid exposition of the great body of law, which till the appearance of the *Commentaries* was a closed book to all but the highly trained expert.

Blackthorn, the popular name of the sloe (*Prunus spinosa*), a common shrub in hedgerows and thickets, marked by its black stems, hard sharp spines or thorns, and the pure white blossoms which appear before the leaves in March and April. The fruit, generally known as 'sloes,' is a small bluish-black drupe of a sour flavour.



BLACKTHORN

The species belongs to the genus *Prunus*, natural order Rosaceæ; from a wild species of *Prunus* the cultivated plum has sprung, but probably not from the sloe. The hardness of the wood of the B. and the fact that its black bark takes a fine polish, makes it a favourite walking-stick; in Ireland its utility for making 'shillelahs' or cudgels has long been well known.

Black Thursday, Feb. 6, 1851, the date of a bush fire of unprecedented magnitude in Victoria, Australia, causing enormous damage and loss of farming stock.

Black Vomit, the characteristic coffee-ground vomit of yellow fever. It is usually met by doses of creosote at short intervals, and the application

of an ice-bag to the upper part of the abdomen.

Blackwall, a dist. included in the metropolitan bor. of Poplar in the E. of London, England. It is a riverside dist. N. of the Thames, containing the E. India Docks and the Thames Iron Works, where have been built many vessels for the British navy. It has been a ship-building centre from early times. The B. Tunnel, giving access from the N. to Greenwich and the neighbouring dists., was begun in 1892 and opened in 1897. It is, with approaches, over 3000 ft. long, 1200 ft. being beneath the river; its internal diameter is about 24 ft. It cost nearly £1,500,000, and was designed by Sir Alexander Binnie.

Blackwall, Anthony, M.A. (1674-1730), classical scholar, graduated at Emmanuel College, Cambridge, and was early appointed headmaster of the Derby School. From 1722 to 1730, with the exception of the years 1726-29, when he was rector of Clapham, Surrey, he was headmaster at Market Bosworth Grammar School, Leicestershire. The wretched experiences which Dr. Johnson had at this school as assistant master belong to a period subsequent to B.'s direction. His most famous work, *The Sacred Classics*, in which he demonstrated the purity of the Greek Testament, appeared in 1725. In his *Introduction to the Classics*, 1718, he gave a scholarly description of the beauties of the ancient writers.

Black Watch, the name of the first of the Highland regiments, so called because its uniform was a dark tartan whilst the regular soldiers wore red. In 1668, the year of its creation, John, second Earl of Athole, was granted a commission to raise a body of men to keep the peace in the Highlands. Three companies only existed from 1704 to the Union, these being under the direct control of the treasury as regards pay, uniform, and fire-arms. But in 1729 the number was raised to six, three of 100 men each and the remaining of 70. Drawn chiefly from the Whig clans of the Campbells, Munros, etc., the B. W. enforced the disarming act under George II., and effectually helped to prevent any further national risings. In 1743 this regiment, now enrolled as the 42nd, served in Flanders, fighting at Fontenoy, etc. A monument, erected by the officers in Dunkeld Cathedral, commemorates all who had died in battle up to the settlement of the Indian Mutiny in 1859. In 1881 what had been the 42nd and 73rd Regiments were drafted into the first and second battalions of the B. W.

Blackwater: 1. A riv. of Essex, England, rising near Saffron Walden. After a south-easterly course, it flows with the Chalmer into the North Sea. 2. A riv. of Ulster, Ireland, rising in the S.W. of Tyrone, and falling into Lough Neagh at the S.W. corner. It is the boundary between Tyrone and Armagh. 3. A riv. in the S.W. of Cork co., Ireland. Rising 16 m. N.E. of Killarney, it reaches the sea at Youghal, after a course of some 106 m. Navigable as far as Cappoquin.

Blackwater Fever, a very fatal, infectious disease occurring in tropical countries and usually associated with malaria. It is characterised by irregular intermittent fever, vomiting, difficult breathing, and discoloured urine. Opinion varies as to whether it should be regarded as a specific disease, or whether the symptoms are merely a development of a malarial affection. It appears to be almost exclusively confined to the white race, and is found in India, Bengal, tropical Africa, Greece, Sicily, S. America, and parts of the United States. Cases are reported from districts where the malarial parasite is not rife, but it has been pointed out that the characteristic symptom, hæmoglobinuria, is met with in other disorders common to tropical countries, and the tendency at the present day is to limit the term to the condition which has been preceded by some form of malaria. Various origins have been proposed for the disease: that it is due to tick-bite, that it is due to a blood parasite, that it is a quinine intoxication, and that it is caused by a form of the malarial parasite. The theory that it is occasioned by the excessive use of quinine has had considerable support, since Koch has observed that after a malarial patient had neglected quinine and then taken a large dose, B. F. was developed. For this reason quinine was formerly discouraged in the treatment of the disease, but more recent investigations have tended to show that to be an unnecessary precaution. The presence of hæmoglobin or red-colouring matter in the urine is the result of the disintegration of red corpuscles through the action, probably, of the malaria parasite. Under favourable circumstances, the liver is capable of dealing with this waste product and the urine remains clear. A large dose of quinine, following upon its disuse for some time, has a depressing effect upon the liver, so that it is no longer able to deal with the débris of the red corpuscles, which therefore passes into the urine. Regular doses of quinine, therefore, are desirable to destroy the malaria parasite which is probably the cause of the blackwater condition as well as of the antecedent malaria. The aim of the treatment is

to relieve the congestion of the liver, to destroy the parasite, to counteract shock, and to guard against nephritis, which is a common and dangerous complication. Epsom salts relieve the congestion, quinine must be administered for the destruction of the parasite, though the manner of its use may be modified by the previous quinine habit of the patient. A copious supply of liquid is necessary to keep the kidneys well flushed and to allay the constant thirst, and the chances of recovery are improved by removal to a non-malarial district, if possible.

Blackwell, Alexander, probably the brother of Dr. Thomas B. Alexander was born in Aberdeen early in the 18th century. He came up to London, having been to Aberdeen University, according to the *Bath Journal*, and was employed by a printer named Wilkins as a corrector of press. He married a wife with a goodly dowry, and set up in business as a printer. He was ruined by the combination of the other printers against him, and spent two years in a debtors' prison, being released therefrom by his wife's talent and industry. He then managed the estates of the Duke of Chandos at Cannon for a time, after which he went to Sweden and took up model farming, first having been physician-in-ordinary to the king. He was beheaded on Aug. 9, 1747, for treason, having attempted in March to induce the king to exclude the infant crown prince from the succession. The real inwardness of this supposed plot has never been discovered.

Blackwell, Elizabeth, the wife of Alexander B., was probably the daughter of a well-to-do merchant. James Bruce's story that she was the daughter of a stocking merchant of Aberdeen has no authority. She extricated her husband from a debtors' prison by making use of her artistic talent. Encouraged by Sir Hans Sloane, Dr. Mead, and Mr. Rand the curator of the Chelsea botanical gardens, she wrote a book with 500 illustrations of medicinal plants in colour. The work appeared in 1737, in two folio vols., and is undoubtedly very well executed, and has a practical value. No further mention is made of Mrs. B.; the date of her death, and even whether she had any children or not, being unknown. Another Elizabeth Blackwell (*b.* 1821) was the first woman to obtain a medical diploma in the U.S.A.

Blackwell, George (1545-1603), archpriest, born probably in London. He graduated at Trinity College, Oxford, and from Oxford he went to Douay, where he was ordained in 1574. In 1576 he returned to England, where his creed brought him into trouble. In 1598 he was made archpriest over the secular clergy of England and Scotland, but was deprived of the office in 1608. He died in gaol at Southwark.

Blackwell, Thomas (1701-57), a classical scholar, son of the Rev. T. B., was born on Aug. 4 at Aberdeen, and educated at a grammar school there, and at Marischal College, Aberdeen University. He took his M.A. in 1718, and was presented with the fellowship of Greek at Marischal College in 1723. In 1748 he was made principal of the college, a post which he held till his death, being the only layman to hold the post since it was under crown patronage. He became Doctor of Laws in 1752, and died at Edinburgh on March 8.

Blackwood, Vice-Admiral Sir Henry (1770-1832), the son of an Irish baronet, was born on Dec. 28. Entering the navy in 1781, he became captain, 1795; rear-admiral, 1814; vice-admiral, 1821. He was warmly congratulated by Nelson for his conduct in a sea fight between the *Penelope*, which B. was commanding, and the *Guillaume Tell* in 1800. He was with Nelson at Cadiz, and afterwards served under Lord Collingwood. In 1807 he narrowly escaped drowning at the entrance to the Dardanelles, where his ship was destroyed by fire. He was present at the blockade of Toulon, and in 1819 he was made K.C.B., and commander-in-chief in the E. Indies. He was commander-in-chief at the Nore from 1827 to 1830, and he died at Ballyleidy, co. Down, on Dec. 17.

Blackwood, John (1818-75), the sixth son of the founder of *Blackwood's Magazine*, born at Edinburgh on Dec. 7. He was educated at Edinburgh High School and University. He superintended the branch of B.'s business in London from 1840 to 1845, during which time his office was the resort of many literary men. In 1845 he returned to Edinburgh on the death of his eldest brother, and in the following year became editor of *Blackwood's Magazine*, and head of the publishing department. He was a friend of George Eliot. He died October 29.

Blackwood, William (1776-1834), founder of the well-known publishing house, and originator of *Blackwood's Magazine*, was born at Edinburgh on Nov. 20. The family of B. has been traced back to the 15th century, one of the members being lord provost of Edinburgh from 1711 to 1713. B. served his apprenticeship to the book-

as a bookseller, dealing principally in old books, in 1804. In 1811 he set up as a publisher on his own account, and six years later, in April 1817, the first number of *Blackwood's Magazine* was issued. Its literary merit procured for it success from the first, and B. gathered together a staff of such ability and distinction as to keep up its reputation. Among the many notable men who contributed to it then may be mentioned: Wilson, whose *nom de plume* was Christopher North, Dr. Moir (Delta), Scott, De Quincey, Galt, Maginn, Thomas Aird, Hogg, etc. William B. himself was chief manager, and managed all correspondence connected with it until his death, which took place on Sept. 16. He was succeeded in the business by his sons.

Bladder, a hollow organ situated in the front part of the pelvic cavity. Its wall is composed of muscular tissue, and the urinary fluid from the kidneys is conveyed to it by two *ureters* which open into the under part of the B. The fluid is expelled through the *urethra*, the opening of which lies a little in front of the entrances of the ureters. The shape when empty is approximately that of a tetrahedron, but it becomes rounded when distended. The size varies with the amount of contained fluid and with the individual. The function of the B. is to serve as a reservoir for the urinary fluid from the kidneys before it is ejected from the body. Inflammation of the mucous membrane of the B. is known as *cystitis*, which may be either acute or chronic. In acute cystitis a blood gorged condition of the mucous membrane with ulceration exists and may be observed by means of the cystoscope, an instrument by which an electric light is conveyed into the bladder by a narrow tube fitted with a lens. The disease may be caused by the decomposition of retained urine, the irritating effect of stony concretions, the use of unclean catheters, the presence of the bacilli of fevers, or gonorrhœa, or by the effect of certain irritants, as cantharides. The symptoms include pain in the supra-pubic region, a constant desire to urinate, and opaque or bloody urine. The treatment aims at removing the cause, if calculi, relieving the painful symptoms, and encouraging the healing of the inflamed membrane. Very hot baths and the application of hot flannels are useful in relieving pain, and plenty of barley water should be drunk, while no strongly flavoured food or drink should be permitted. If the urine is acid, alkaline waters such as Vichy should be drunk; on the other hand, alkaline urine should be met by doses of benzoic acid. Morphia suppositories are used if great pain is felt. Chronic cystitis may arise from the effects of stone or through neglected or repeated acute cystitis. The symptoms are similar, but not so intense, except that there is often more pus and albumin than in the acute form. The cause should be dealt with, whether calculus, antecedent prostatitis, or stricture. The B. should then be irrigated with sterilised water; at first plain boiled water and then water containing 1 in 15,000 of perchloride of mercury. The patient should be encouraged to expel the irrigating liquid from the B. himself. To give the B. a rest, it may be drained by incision. Obstinate cases often yield to a change of general surroundings and diet. The rest cure at Wildungen is recommended for cases with alkaline urine and the waters at Contrexeville for acid urine. Other disturbances of the ordinary functions of the B. are irritability, often due to worry, overwork, or nervousness; incontinence of urine, generally in children; and retention of urine, perhaps a nervous failure or actual obstruction as the cause. In each case the cause should be dealt with. Incontinence in children generally cures itself; in older people general hygiene and habits of life should be looked to, and small doses of belladonna and the use of the faradic current help to effect a cure.

Bladder-nut, or *Staphylea pinnata*, is a species of Staphyleaceæ. It is a shrub which grows in northern lands, and has a large, bladdery capsule as its fruit. The seeds are edible and yield oil.

Bladder-seed, or *Physospermum cornubiense*, is a genus of Umbelliferæ common to Europe and W. Asia. The fruit is a schizocarp which is much inflated.

Bladder-senna, or *Colutea arborescens*, is a species of Leguminosæ cultivated in India and S. Europe. The legume dehisces when touched or in a strong wind, and thus scatters the seed. The leaves have properties similar to those of the genus *Cassia*, and are used in the adulteration of senna.

Bladder-worm, or Hydatid, a stage in the development of a cestode, or tape-worm. The egg of the tape-worm gives rise to a six-hooked embryo, which reaches the first host. It then develops into the larval form, when a cyst or bladder is formed round the vital portion. When the B. is swallowed by its final host, the scolex or vital portion is everted, the tail is thrown off, and the worm proceeds to develop segments and becomes the complete tape-worm.

Bladderwort, or *Utricularia vulgaris,* is an aquatic carnivorous plant of the order Lentibulariaceæ found in ditches and ponds in Scotland and Ireland. It occurs as a submerged water-plant with finely-divided leaves, but the flowers appear above the surface on short stems; the plant has no roots. On the submerged leaves are borne curious little bladders, one-eighth to one-quarter of an inch in diameter. They are filled with water, and the entrance is effected by a valve which is a sort of trap-door, guarded by long hairs to prevent large creatures from entering. Small crustacea and other animals pass in by the trap-door, but cannot return; and when the dead prisoners are decomposed they are absorbed by the cells which line the bladder.

Bladensburg, a vil. of Maryland, in the U.S., situated on the E. branch of the Potomac R., 6 m. N.E. of Washington. On Aug. 24, 1814, a battle was fought, in which the British were victorious, which decided the fate of the capital. Pop. 500.

Blades, William (1824-90), printer and bibliographer, became partner in his father's printing business. His interest in the history of printing led to the publication of his *Life of Caxton,* 1861-63, in which, by a careful comparison of types, he classified many Caxton editions. In his popular *Enemies of Books,* 1881, he discusses their foes, human and insect. A collector of old books and medals, he took an active part in public work, and was a keen supporter of the newly-formed L

Blaeberr

is known

Myrtillus, and is common to hilly dists. of Britain. Unlike many of the Ericaceæ, the leaves are not evergreen; the berries are blue-black in colour and are made into jam.

Blaenau Festiniog, a tn. of Merionethshire, 9 m. N.E. of Portmadoc, on the L. and N.W., G.W., and Festiniog narrow gauge railways. It has extensive *slate quarries.* Pop. 7700.

Blaenavon, a tn. of N.W. Mon- and N.W., with iron- 11,500. to Scottish he shale of thereby its

'blae' or bluish colour.

Blaeu, Blaeuw, or **Blauw, Jan,** a Dutch cartographer, the son of W. J. B., first started in business in partnership with his brother Cornelius, who died in 1650. In 1637 he set up in business for himself in Amsterdam. His *Atlas Major,* in eleven vols., is a noteworthy work illustrated with quaint old plates and maps. The vol. on Scotland has forty-nine maps prepared by Timothy Pont, and many local details by Sir John Scott. The work as a whole is valuable now because of the light which it casts in many places on local history. B. also pub. a series of topographical plates and views of various tns. He left three sons, of whom two carried on the business successfully till 1700. He died in 1673.

Blaeu, Blaeuw, or **Blauw, Willem Janszoon** (1571-1638), map-drawer and printer, was born at Alkmaar in Holland. He was a pupil of Tycho Brahe, and excelled all his predecessors in the making of terrestrial and celestial globes.

Blagden, Sir Charles (1748-1820), physician, was born on April 17, and spent most of his life in the army medical service. He became secretary of the Royal Society in 1784, and in 1789 he was elected a correspondent of the Académie des Sciences, Paris. He did a certain amount of research work, and was also interested in antiquarian matters. He died at Arcueil, near Paris, on March 26.

Blagdon, Francis William (1778-1819), miscellaneous writer, began life as a newspaper boy, obtained later a secretaryship to a doctor, and acquired some acquaintance with Fr.; Ger., Spanish, and It. By turns he was publisher and author, and from about 1805 he was one of the editors of the *Morning Post,* then a Tory paper. As a journalist B. proved polemical, and fiercely attacked the proposal to remove Catholic disabilities. His use of the name of a leading Catholic divine as a pseudonym to his new ed. of Fox's *Martyrs* was thoroughly dishonest. A glance at the list of his works proves him to have been a mere hack writer, prepared to write on any subject.

Blagodat, a peak in the Ural Mts., Perm, Russia, 127 m. N.E. of Perm, and near Kushva. It is rich in magnetic iron ore, and is surrounded by numerous royal iron-works. Altitude, 1260 ft.

Blagoveschensk, a tn. of E. Siberia, cap. of the Amur gov., on the Amur R. Scene of a dreadful massacre of Chinese civilians by Russian troops in 1900. It is the centre for the Zeya gold-mining dist., tea exportation to Russia, and cattle importation from Mongolia. It has also steam flour-mills. Founded in 1856, it has now a pop of 40,000.

Blaikie, William Garden (1820-99), Scottish divine, born at Aberdeen. For twenty-four years he was minister at Pilrig, Edinburgh (1844-68), and afterwards became professor of apologetics and pastoral theology at New College, Edinburgh, 1868-97.

He was an ardent social and temperance reformer, and wrote extensively on social and theological subjects.

Blain, an old tn. in the Fr. dept. of Loire-Inférieure, situated on the R. Isac, 12 m. from St. Nazaire. There are tile and brick works. Pop. 7000.

Blaina, in Monmouthshire, 6½ m. N.W. of Pontypool, on the G.W.R. It has coal mines, iron-works, and tin-plate works.

Blaine, James Gillespie (1830-93), an American statesman, born at W. Brownsville, Pennsylvania, on Jan. 31. Of Scotch-Irish parentage, he graduated at Washington College in 1847, and afterwards taught in the Military Institute, Georgetown, Kentucky, and the Institute for the Blind at Philadelphia. He then studied law in Augusta, Maine, and was editor of the *Kennebec Journal* and of the *Portland Advertiser*. He at length found his true vocation in politics, being elected to the Lower House of the state legislature in 1858 as a Republican. He remained there for four years, being Speaker the last two years. He was made chairman of the Republican state committee in 1859, and for more than twenty years from then he conducted all campaigns of the party. In 1862 he was elected to Congress where he sat for thirteen years, being Speaker of the House from 1869 to 1874; he sat for four years in the Senate. In 1881 he was appointed Secretary of State under President Garfield; he resigned after the assassination of the latter, but held the same office later, from 1888 to 1892, under President Harrison. He was defeated in the Republican nominations for the presidency in 1876, 1880, 1884, and 1892. He strongly opposed the issue of paper money during the Civil War, and the immigration of Chinese. As Secretary of State he was in favour of reciprocity treaties with other nations, but adopted a firm position in the sealfisheries controversies with Great Britain. He was a ready debater, and resourceful in controversy. He wrote *Twenty Years of Congress*, 1884-86, two vols., and *Political Discussions*, 1887. He resigned on June 14, 1892, and died in the following year.

Blainville, Henri Marie Ducrotay de (1777-1850), a French naturalist, born at Paris. After being an artist and a musician, he became a naturalist in 1804, and two years later was a doctor of medicine and the assistant of Cuvier. He became professor of anatomy and zoology at Paris University in 1812, and a member of the Academy of Sciences in 1825. In 1832 he succeeded Cuvier, on the latter's death, as professor of comparative anatomy at the Collège de France. He died on May 1 at Paris.

Blair, Hugh (1718-1800), an author and minister, was born of Scottish parents in Edinburgh. He was minister of Canongate Church, Edinburgh, in 1743, and in 1754 of Lady Yester's church for four years. In 1758 he served in the High Church. The year following he began to lecture on rhetoric for the Edinburgh University, and he was forthwith appointed a professor. Among his works are *Lectures on Rhetoric and Belles Lettres*, 1783; *Sermons*, etc.

Blair, John (*d.* 1782), a chronologist, was a member of the B. family of Balthaycock, Perthshire. He was born at Edinburgh, and there also he was educated. In 1754 his *Chronology and History of the World from the Creation to the Year of Christ* 1753 was pub. by public subscription. In 1755 he became a fellow of the Royal Society, and in 1757 was chaplain to the Princess Dowager of Wales and tutor to the Duke of York. In 1761 he had a prebendal stall in Westminster, and the same year he was made a fellow of the Society of Antiquaries.

Blair, Robert (1593-1666), divine, graduated at Glasgow University and became a licensed preacher of the Scottish Presbyterian Church in 1616. Ordained as bishop of Down, Ireland, in 1623; he was deposed nine years later for nonconformity. When he was excommunicated in 1634, he set out for New England, but stormy weather drove the ship home again. In 1640 he came to England as one of the commissioners from the General Assembly to explain Presbyterianism to Episcopal clergy. Six years later he was elected moderator of the General Assembly, the highest office of his Church, but after the Restoration, like other outcast Covenanters, he risked his life by preaching in open-air retreats.

Blair, Robert (1699-1746), a poet and Scottish minister, born at Edinburgh. In 1731 a living was bestowed upon him at Athelstaneford in E. Lothian. His principal poem is *The Grave*, which had some merit and dignity. He died at his manse in Athelstaneford.

Blair, Robert, of Avontoun (1741-1811), judge, born at Athelstaneford, was the son of a minister, and finished his education at the university of Edinburgh. From 1789-1806 he held the post of solicitor-general for Scotland, and in 1808 became president of the College of Justice, which office he held till his death.

Blair, Robert (*d.* 1828), professor of practical astronomy at Edinburgh University from 1785 till his death,

is chiefly remembered for his work in optics for the improvement of the telescope. Applying himself to the question of achromatisation, he found that, by using lenses filled with solutions of mercury or antimony in hydrochloric acid, he was able to give the telescope an aperture of one-third of its focal length, without any trace of residual colour.

Blair Atholl a vil. in the Scottish co. of Perth, 30 m. N.N.W. of that city, at the confluence of the Garry and the Tilt. Blair House, the seat of the Duke of Atholl, is situated at a distance of 1¼ m. from the vil. Part of it dates from the 13th century.

Blairgowrie, a Scottish town of Perthshire, situated on the r. b. of the R. Ericht, 20 m. N.N.E. of Perth. The prin. industry is flax-spinning and weaving, the factories for which obtain their power from the Ericht. B. is a summer resort on account of its pure air and picturesque situation. Cairns and druidical remains have been found in the vicinity. Pop. 4000.

Blake, Robert (1599-1657), a famous Eng. parliamentarian and admiral. He was the son of a well-to-do merchant, and was born probably in the Sept. of the year 1599. He received a good education at Bridgewater Grammar School, and later at Wadham College, Oxford. During the years which followed his leaving college he was probably engaged in trade, and seems to have prospered in it. He entered parliament in 1640, representing the bor. of Bridgewater in the Short Parliament, with the abrupt dismissal of which parliament his career as a politician for the time being came to an end. On the outbreak of the inevitable struggle he sided with parliament and distinguished himself by his staunch resistance at Bristol against Prince Rupert, and later at Lyme Regis and at the capture of Taunton. The defence of Taunton against two royalist sieges raised his reputation high, and in 1645 he entered parliament as its representative. Remaining an active supporter of parliament even after the execution of the king, he was appointed 'general of the seas,' and was very active in his pursuit of the royalist fleet commanded by Prince Rupert. This fleet he blockaded first in Ireland and later in Portugal, avenging himself for the Portuguese refusal to allow him to attack the royalists by causing great damage and loss to the Portuguese fleets. In Nov. 1650, the royalists having been politely requested to leave Portugal, B. attacked them near Cartagena and destroyed them. For this he received the thanks of parliament and a financial grant. He still remained admiral of the fleet, and captured the Scilly Isles, being, as a reward, made a member of the Council of State. During the Dutch war which broke out in 1652, B. continued to distinguish himself and defeated Van Tromp off Dover in the May of that year. After sev. successes against the Dutch, he suffered a defeat which he avenged by defeating the Dutch admirals in a three days' fight which took place in the Channel. For a short period B. was compelled by ill-health to retire from active service, but in 1654 he again came into active service. He was sent with a fleet to exact reparation from the Duke of Tuscany, the Knights of St. John of Malta, and the Moorish pirates of the N. coast of Africa. Tunis was the only place which resisted him, and Tunis suffered by being bombarded and having its fortifications destroyed. The next war in which B. played a signal part was the Spanish War. Here, after cruising round the neighbourhood of Cadiz, he attacked the Plate fleet in the harbour of Santa Cruz in Teneriffe. The action was bold and valiant, the harbour was narrow and well fortified, but the action was successful; the forts, castle, and fleet were entirely destroyed by the almost incredible attack of B. and his fleet. This was his last great action, but for it he received the thanks of parliament and the nation, and a diamond ring in testimony of his bravery. He died at sea within sight of Plymouth. He was buried with great pomp and solemnity in Westminster Abbey. His body was disinterred at the Restoration and buried in the churchyard of St. Margaret's.

Blake, William (1757-1827), an Eng. poet and engraver, born in London, the son of a hosier whose real name is said to have been O'Neill. His father was a disciple of Swedenborg, who had prophesied that the year 1757, the date of B.'s birth, would be the beginning of a new world. This undoubtedly had an influence upon the natural mystic tendencies of the boy, who saw visions and conversed with angelic beings from a child. He early showed a taste for art, and at the age of ten was apprenticed to Par, in the Strand, passing on to the engraver Basire, who set him to drawing monuments in old London churches, thus inducing his love of Gothic art. In 1778, after studying for a short time at the Royal Academy, he became an independent engraver, producing some of the early work of Stothard, and making the acquaintance of Flaxman and Fuseli. In 1782 he married Catherine Boucher, who, though of humble birth, became his skilful and

sympathetic assistant in artistic and literary work. His first vol. of poems, *Poetical Sketches*, appeared in 1783, but met with an indifferent reception. In 1784 he opened a printseller's shop, having as assistant his younger brother Robert. Robert died in 1787, and it was due to his inspiration that William conceived the idea of engraving his poems and illustrating them with his own conceptions. In 1789 he issued *Songs of Innocence*, the book being entirely designed and produced by himself and his wife. In the same year appeared the *Book of Thel*, the first of his 'prophetic books,' which he believed were supernaturally dictated to him. These were followed by *The Marriage of Heaven and Hell*, 1790; *The Gates of Paradise*, 1793; *The Vision of the Daughters of Albion*, 1793; *America*, 1793; *Songs of Experience*, 1794; *Europe*, 1794; *The Book of Urizen*, 1794; *The Song of Los*, 1795; *The Book of Ahaniah*, 1795; *Jerusalem*, 1804; *Milton*, 1804. From 1801-4 he lived at Felpham in Sussex with Hayley, for whose *Life of Cowper* he engraved the illustrations. After 1804 he devoted himself entirely to illustrative work, which included engravings for Blair's *Grave*, 1804-5, and designs for *The Book of Job*, 1821; *Paradise Lost*, 1822; and the *Divina Commedia*, 1825. His artistic work reveals great natural genius, which, had it been disciplined in conception and expression, would have placed him high among Eng. artists. His later work, particularly, becomes almost unintelligible. The same is true of his poetry. His early writings have a wonderful charm and freshness, but his 'visionary' works almost suggest a form of insanity.

Blakeney, William, Baron (1672-1761), soldier; is said to have been the first to employ colour or drum to drill companies. Throughout Marlborough's campaigns he served as adjutant to his regiment. The enmity of Lord Verney hindered his advancement, so that he was sixty-five before he was promoted colonel. The Duke of Richmond, however, secured him the lieutenant-governorship of Stirling Castle in 1715, having recognised his gallant services in the Cartagena expedition of 1741. His successful defence of that castle against the Highlanders led George II. to appoint him lieutenant-governor of Minorca in 1747. As the governor never appeared, the burden of the defence of the is. against the Fr. troops under Richelieu and La Gallisonnière at the commencement of the Seven Years' War, 1756, fell entirely upon B. Admiral Byng, who was afterwards executed for cowardice, came with a relieving squadron, but sailed away again, thus leaving B. no alternative but to surrender. Many honours, including the command of the Enniskillen regiment of infantry, awaited the veteran on his return home.

Blakesley, Joseph Williams (1808-85), Dean of Lincoln, was born in London on March 16. He was educated at St. Paul's School and Corpus Christi and Trinity Colleges, Cambridge, becoming fellow and tutor of the latter college. He was ordained deacon in 1831, became canon of Canterbury in 1863, and dean of Lincoln in 1872. A *Life of Aristotle*, 1839, and an edition of Herodotus, 1852-54, were his chief works.

Blakey, Robert (1795-1878), author, was born in humble circumstances at Morpeth on May 18. His early years were spent in journalism. In 1838 he purchased the *Newcastle Liberator*, and in 1840 was bound over to keep the peace for publishing an article on the right of resisting the constitutional authorities. He sold his paper at a loss, and devoted himself to philosophical studies, publishing his chief work, *History of the Philosophy of Mind*, in 1848. In the same year he became professor of logic and metaphysics at Queen's College, Belfast. He published sev. books on angling, in which he was greatly interested.

Blakiston, Thomas Wright (1832-91), explorer, was born at Lymington, Hampshire, on Dec. 27. Joining the army in 1851, he saw service in the Crimea and elsewhere, but a few years later he turned explorer. His chief work as an explorer was done on the upper course of the Yang-tse-Kiang in 1861. From 1863 to 1884 he was a merchant in Japan, and there interested himself in ornithology. He died in California on Oct. 15.

Blamire, Susanna (1747-94), a Cumberland poetess, was born at Cardew Hall, near Carlisle, and she died at Carlisle. Her poems were not pub. until 1842, when they were collected, with considerable trouble, by Henry Lonsdale, M.D., and Patrick Maxwell, two gentlemen who became interested in her work. The collection, which was pub. under the title of *The Poetical Works of Miss Susanna Blamire, the Muse of Cumberland*, contains some of the best of north-country lyrics.

Blamire, William (1790-1862), tithe commissioner and agriculturalist, graduated at Christ Church, Oxford, and disappointed his father because he insisted on settling down at a farm near his home at Dalston, Cumberland. He became so popular with the yeomen of the county, because he was always willing that his neighbours should profit by his experiments in agric. improvements, that in 1828 he was appointed high-sheriff, and three

years later, after an exceptionally exciting election, was returned to *parliament as a representative of the* Whig party. In 1836 he made a remarkable speech on the Tithe Commutation Bill, and, when it became law, was at once nominated chief-commissioner to supervise its administration. The work of assessing the rent-charges for each parish and of apportioning those charges between various properties was further complicated by the lack of reliable maps, and lasted from 1836 to 1851. It was at B.'s suggestion that the ordnance survey of 1842 was undertaken. His practical and expert knowledge of land tenure also rendered his assistance invaluable to the government in preparing both the Copyhold Enfranchisement Act of 1841, and still more the Commons Enclosure Act, 1845. The principles he laid down in a Highways Bill of 1846 have guided all later legislators on that subject.

Blanc, François, a Fr. financier, originally the owner of a casino in Homburg. On the expiry of his lease there he obtained, in 1861, a concession from Charles III. for the lease of the casino of Monte Carlo for fifty years. At his death it was taken up by the Société Anonyme des Bains de Mer et Cercle des Etrangers.

Blanc, Jean Joseph Charles Louis (1811-82), a Fr. revolutionary politician and historian, born at Madrid on Oct. 29. He studied law at Paris, and contributed to various journals. He founded the *Revue du Progrès* in 1839, and published in it an article on the 'Organisation of Labour,' the principles of which are those which guided him all his life. In this article he states his view that competition is the main evil of modern industry. For a remedy he proposes equalisation of wages, social workshops, and such measures; made possible by a recognition that personal interests are of less importance than the welfare of the community. In 1841 B. pub. his *History of the Ten Years* 1830-40, which caused a great sensation, and did much harm to the cause of Louis Philippe. The first two volumes of the *History of the French Revolution* came out in 1847. On the success of the revolution of 1848, he became a member of the provisional gov., and presided over a [illegible] report on labour [illegible] of his repudiation [illegible] for the disastrous *ateliers nationaux*, and unfairly held responsible for them. The sansculottes wished to place him at their head, and the National Guard wished to imprison him: he was charged with complicity in the disturbances of May, June, and August, and condemned in his absence. He took refuge in England, and remained there until the downfall of the empire. During his sojourn he completed his *History of the French Revolution*, in twelve vols. On his return to Paris he was in 1871 elected a member of the National Assembly. He died at Cannes on Dec. 6. Though he possessed a vivid style and a good power of research, his historical writings are too *political in tone. His works have had* a great influence in forming and influencing socialist opinion in France.

Blanc, Le, a tn. on the Creuse in the dept. Indre, France. Has woollen manufactures, etc.

Blanc, Mont, the culminating peak in the mt. range bearing the same name, is the highest mt. in the entire chain of the Alps, and in Europe with the exception of certain peaks in the Caucasus Mts. It rises to the S. of Chamonix, in Fr. ter., and to the N.W. of Courmayer, which belongs to Italy; when the treaty which ceded Savoy to France was ratified in 1861 it was agreed that France should have the possession of the highest summit. The mt. range named M. B. forms part of the Pennine Alps and is unequally divided between France, Italy, and Switzerland; M. B. itself rises to a height of 15,782 ft. In former days the mt. was called in some places the Montague Maudite, or simply Les Glacières, but the present name appears to have been always in local use; the name M. B. occurs in an It. document of the year 1694. Its old name, Les Glacières, had its origin in the distinguishing feature of the mt., the immense glaciers which are found on all sides of it. Among the best known may be mentioned those of Bossons and Tacounaz, on the northern slope, and those of Brenva and Miage on the southern slope. The first ascent of M. B. was made in 1786 by two Chamonix men, Jacques Balmat and Dr. Michel Paccard. In the following year Jacques Balmat and two local men again made the ascent, whilst later in 1787, the eminent Genevese naturalist, to whom a statue has been erected at Chamonix, H. B. de Saussure, made the third ascent. The [illegible] ain the summit [illegible] who achieved [illegible] feat a week later than De Saussure. These ascents were all made [illegible] Chamonix, which is the usual [illegible] ing-place, though in the course of time ascents have been made from almost every side. The easiest route is by way of the inn of the Grands Mulets, from Chamonix, to the Bosses du Dromadaire shelter-hut, and thence to the summit. Miss Isabella Straton

in Jan. 1876 was the first to make an ascent in winter. The view from the summit of the mt. is naturally very extensive, Lyons being visible, but owing to the great height is not so clear as might be wished. The inn at the Grands Mulets stands at a height of 9909 ft., the shelter-hut at the Bosses du Dromadaire, built in 1890 by M. Vallot, at a height of 14,312 ft., whilst in 1893 an observatory was constructed just below the summit by T. J. C. Janssen. See *The Annals of Mont Blanc*, by C. E. Mathews, 1898; and the *Carte de la Chaine du Mont Blanc*, 1896, by L. Kurz.

Blanca Peak, estimated to be the highest peak in Colorado, U.S.A. It is in the county of Costilla, and is among the Sangre de Cristo range. Its altitude is 14,464 ft.

Blanch, or **Blench**, **Holding**, the name of one of the ancient feudal tenures in the law of Scotland. Under this holding the vassal has to pay to the superior only a nominal duty, as a badge of servitude, such as a penny Scots, a bunch of roses, or, as in the case of Jock Howieson, the service of a ewer and basin in order that the king may wash himself. It is now seldom adopted in the constitution of the original right of property. In the matter of casualties, etc., it is the same as feu and charter tenure.

Blanchard, Edward Litt Laman (1820-89), a miscellaneous writer, was the author of a vast number of dramas, farces, and burlesques. For thirty-seven years he wrote the Drury Lane pantomime, and he sold many plays to provincial theatres at ten shillings an act. As dramatic critic he contributed to many papers, among them being the *Weekly Despatch* and *Daily Telegraph*. From 1841-5 he was in turn editor of three papers. In spite of these activities he found time to write two novels, countless comic songs, and illustrated guides to places of interest. Hardly any of his works have been published.

Blanchard, Jacques (1600-38), a painter, born at Paris. He studied under his uncle. In 1624 he visited Rome, and two years later Venice. Here he studied the paintings of Titian and others, producing, himself, a few works which brought him publicity. He returned to Paris and executed numerous works. In virtue of these he was called the Fr. Titian. 'The Descent of the Holy Spirit,' which hangs in Notre Dame, is considered his best painting.

Blanchard, Samuel Laman (1804-45), journalist, was educated at St. Olave's, Southwark. After being clerk to a proctor in Doctor's Commons, and member of a travelling dramatic company, he accepted, in 1827, the secretaryship of the Zoological Company. He was editor in turn of the *Monthly Magazine*, the *Constitutional*, the *Courier*, and three others. At his death he was connected with the *Examiner*. Grief at the loss of his wife and overwork caused him to commit suicide.

Blanchard, William (1769-1835), comedian, was prompted by his delight in Shakespeare to become an actor. In 1785 he joined Mr. Welsh's travelling company, and after an unsuccessful attempt as a theatre manager, made his début at Covent Garden as Bob Acres, in 1800. With this theatre he was connected until 1834, except for one break when he toured in America. In his youth he was favourably compared with John Kemble, and was especially famous for his Shakespearian impersonations of Fluellen, Polonius, and Menenius, whilst Leigh Hunt enjoyed above everything his interpretation of the rôle of the Marquis de Grand-Château in the musical play, *The Cabinet*. De Wilde painted him as Sir Andrew Aguecheek.

Blanche Dent, an Alpine peak, rising to the W. of Zermatt and opposite to and N. of the Matterhorn. Its alt. is 14,318 ft. The ascent, which presents great difficulties, was first made by T. S. Kennedy and W. Wigram in 1862.

Blanching, or **Etiolation**, is the name given to a system of culture which is resorted to by gardeners in order to render certain plants and vegetables more succulent. The action of light is a necessity to the leaves of plants in order that they may decompose carbonic acid gas, and consequently the exclusion of light causes changes in the metabolism of plants. Many vegetables which when grown under ordinary conditions are bitter, coarse, and injurious, are made tender and tasteful by B. B. is usually an artificial process, though a kind of natural etiolation may be observed in the cabbage. There are three main ways of B. plants: (*a*) By earthing up the leaves and stems of plants. This practice is followed in the case of celery, asparagus, etc. Celery is planted in trenches, and earth is drawn up round the plants as they grow. (*b*) By tying up the leaves with pieces of bass; this is the method adopted in the case of cos lettuces, and sometimes with endive. (*c*) By overlaying with tiles, slates, or B. pots, which are earthenware vessels of a sugar-loaf shape. By this means the light is excluded from seakale, rhubarb, etc., and no green appears in the leaves. The B. pot is often employed in France for lettuce, and in the Pyrenees celery is blanched

by this means. Cardoons are blanched by tying up each plant into a long, oval, and compact bunch. A drain-pipe filled with sand is then placed over each plant, or they are earthed up after the fashion adopted with celery. B., whilst being by no means a difficult process, is one which has very important results. By means of this process, seakale, which otherwise is uneatable if not absolutely deleterious, is rendered palatable and appetising, whilst the common dandelion, when etiolated, is worthy of a place in a salad.

Blanc-mange, from the Fr. *blanc manger*, meaning 'white food,' was originally a dish composed of savouries—meat, eggs, etc. It is now a sweet dish made of cornflour, gelatine or isinglass, and milk.

Blanco, Antonio Guzman (1828-99), a Venezuelan soldier and a native of Caracas. The Federal revolts of 1859-63 saw him actively engaged. He became vice-president under Falcon in 1863. By a counter-revolution he triumphed over an attempt to depose him, and became president on the death of his superior. A series of re-elections skilfully manipulated kept him in office till 1888.

Blanco Cape, the name of a headland on the W. coast of Africa, in 20° 47′ N. lat. and 16° 58′ W. long. It lies at the extremity of a rocky ridge projecting fror
of the Sahar
cape) is also a
and the Philippines.

Bland, Humphrey (1686-1763), general and military writer, took part in the Jacobite rebellion of 1715, and also in the rebellion of 1745, where he
in the Culloden, whilst he was
the king's dragoon guards that he pub. his *Treatise on Discipline*, 1727, which served for many years as the recognised text-book on that subject. As quartermaster-general at headquarters he distinguished himself at Dettingen and Fontenoy during the Flanders expedition. From 1749 he was governor of Gibraltar, till he was appointed in 1753 commander-in-chief of the Scottish forces—a post which he held to his death.

Bland, Maria Theresa (1769-1838), vocalist, was the daughter of an It. Jew. Her first appearance at Drury Lane was in 1786, when she took the part of Antonio in Grétry's *Richard Cœur-de-Lion*, and she was connected with this theatre almost continuously until 1824, when an attack of melancholia obliged her to renounce the stage. But she also sang at Vauxhall and the Haymarket. She was remarkable for the sweet quality of her voice (mezzo-soprano) and her unaffected style, whilst as an actress it was her vivacity which charmed.

Blandform Forum, the name of a parl. and municipal bor. and mrkt. tn. of Dorsetshire. It lies on the Stour, near the ford called by the Romans *Trajectus Belariensis*. B. was formerly noted for lace. Pop. 4000.

Blandrata, Giorgio, properly Biandrata (*c.* 1515 - 90), Unitarian, was obliged, like others, to flee to Geneva in 1556 because of his heterodoxy, where he remained until Calvin's wrath drove him to Poland, where Unitarianism was gaining ground. Finally he took refuge in Transylvania, where, as physician to John Sigismund, the prince, he was able to spread his doctrines over a wide sphere. Transylvanian Unitarianism was probably founded by him.

Blane, Sir Gilbert (1749-1834), physician, was born at Ayrshire, Scotland. At fourteen he went to Edinburgh University, originally to study for the church, and ultimately for a doctor's career. He took his M.D. degree at Glasgow University in 1778. Later on he left for London, and became private doctor to Lord Holdernesse. In 1779 he went out to the W. Indies as physician to Admiral Rodney, and from that time he was physician to the fleet. He wrote accounts of sev. engagements and victories which he witnessed, and he received a pension from the crown. In 1781 he accompanied Rodney home, and in the same year he was admitted as Licentiate of the College of Physicians. He was famous for the reforms which he introduced while he had medical charge of the W. India fleet. He was consulted by the Home Office upon several matters, and also by the Turkey Company. He helped in drawing up the rules for the Quarantine Act of 1799.

Blanford, Henry Francis (1834-93), geologist and meteorologist, studied at the School of Mines, and at Freiberg, Saxony. As a member of the Geological Survey of India, he classified the cretaceous strata near Trichinopoli, but failing health induced him to accept a less arduous professorship at Presidency College, Calcutta, 1862-72. His interest being diverted to the study of climates and weather, he was appointed meteorological reporter to Bengal, in which capacity he made valuable discoveries as to the cause of cyclones and also pub. many treatises dealing with the meteorology of India. In 1880 he was elected F.R.S., and in 1884 president of the Asiatic Society of Bengal.

Blanford, William Thomas (1832-1905), geologist. He was born in London on Oct. 7, and was educated at the

Royal School of Mines, London, and later at the Mining Academy, Freiberg, Saxony. Between 1855 and 1882 he formed part of the geological survey party to India, and later accompanied the Abyssinian Expedition in 1868. He became president of the geological section of the British Association in 1884, and has pub. *Observations on the Geology and Zoology of Abyssinia*, 1870; *A Manual of the Geology of India*, 1879; and *Mammalia*, 1888-91.

Blankenberghe, a small tn. on the coast of W. Flanders, 13 m. N.E. of Ostend. It has a fishing industry, and shipbuilding is carried on. It is best known as a summer resort, however, having made great strides in popularity of recent years. Pop. 5500.

Blankenburg, a health-resort in the Ger. principality of Schwarzburg-Rudolstadt, Thuringia, at the confluence of the Rinne and the Schwarza, 27 m. S.W. of Jena. It is situated in a lovely neighbourhood, and near by are the fine ruins of the castle of Greifenstein, built by the Ger. king, Henry I.

Blankenburg, a tn. in the Ger. duchy of Brunswick, at the foot of the Harz Mts., 12 m. S.W. from Holberstadt by rail. It has a castle, a museum of antiquities, several fine churches, and pine-needle baths. From the Teufelsmauer (the devil's wall), which is in the neighbourhood, fine views can be observed. The town, which is a noted health resort, has a pop. of 11,000.

Blanket, a woollen or in some cases cotton fabric used as a covering on beds, etc. Whilst all good Bs. are made wholly of wool, many Eng. blankets of inferior quality are made of cotton warp and woollen weft. In these Bs. the threads of the woollen yarns are raised to the face of the fabric in a loose, soft mat so as to hide the cotton threads. The process by which this is done is called 'teazling,' and it is effected by means of steel brushes called 'teazles,' which are fixed in 'gigs,' or brushing machines, and brush up the threads on the face of the B. The principal varieties of Eng. Bs. are the Witney, the Kersey, the Yorkshire, the Bath, and the Bury, the last-named being more like ordinary wool cloth. The Scotch Bs. are always made wholly of wool, and are more durable, though sometimes not so comfortable, as the Eng. The prin. Scottish mills are in Ayrshire, Berwickshire, and at Markinch in Fifeshire. At the Philadelphia Exhibition of 1876 some exceedingly fine American Bs. were shown. Very delicate Bs. come from Mysore, in India, being made of such fine fabric that they can be rolled up into a marvellously small compass. The price of these Bs. is about £30; the usual Eng. prices range from 4s. to £2.

Blanketeers, the nickname given to 5000 Lancashire operatives who met in St. Peter's Field, near Manchester, on March 10, 1817. They determined to march to London and see the prince regent in order to obtain redress of their grievances. The Habeas Corpus Act was suspended and the leaders imprisoned, whilst the bulk of the operatives yielded. As a result of the meeting, however, the spokesmen had an interview with the minister, and some reforms were made. The name B. was given to them because each carried a blanket for camping out.

Blank Verse, or verse without rhyme, is, especially in its decasyllabic form, one of the two outstanding features of English poetry, alliteration being the other. In its wider sense the term B. V. signifies all verse in which the rhymes are 'blank,' that is to say, lacking, but the term has come to have a more restricted significance, being generally applied to verse consisting of ten-syllable iambic lines. The English language runs more easily in the iambic metre than in any other, and the line of five iambuses bulks largely in English B. V., in fact this form is the general medium of our epic and dramatic poetry. This length of line has naturally been chosen for this purpose, for the eight-syllable line is too short for really dramatic effects to be obtained, whilst, on the other hand, the twelve-syllable line is apt to drag and become monotonous if it lacks the aid of rhyme. Longfellow has in two well-known pieces tested his power of writing B.V. of both the long and the short line, his popular *Hiawatha* being in eight-syllable lines and *Evangeline* in sixteen. *See* POETRY AND VERSE.

Blanqui, Jérome Adolphe (1798-1854), Fr. economist, was born at Nice on Nov. 21. He was a schoolmaster at Paris when he was caused to study economics by reading the works of J. B. Say, whose pupil and assistant he became. He was appointed to a professorship of industrial economy and of history at the Conservatory of Arts and Crafts, upon Say's recommendation, and succeeded the latter as professor of political economy in 1833. In 1838 he became a member of the Academy of Moral and Political Sciences. He was indefatigable in research, and had a most thorough knowledge of the working classes of France. His most important work is his *History of Political Economy in Europe*, 1838.

Blanqui, Louis Auguste (1805-81), a Fr. revolutionary politician, was

born at Pujet-Théniers, near Nice. He studied both law and medicine before taking up a political career. He was decorated for his services in the revolution of 1830, but continuing to preach his Republican doctrines during the reign of Louis Philippe, he was often imprisoned. He was condemned to death in 1840, but the sentence was commuted to imprisonment for life. He was leader of the extreme socialist party after the revolution of 1848, but was sentenced to ten years' imprisonment in 1849, and again in 1861, but escaped and was abroad till after the downfall of the empire, when he returned and founded *La Patrie en Danger*. He was condemned to death in 1871 for his part in the doings of the '31st Oct.;' a few days afterwards he was made a member of the insurgent gov. He was elected deputy for Bordeaux in 1879, but the election was invalid owing to his being in prison; he was, however, set free. He died as the result of an stroke on Jan. 1. He was his fanatical devotion to co:... as is evidenced by the fact that he spent half his life in prison.

Blantyre, the chief town of Nyassaland Protectorate, British Central Africa. It is situated at a height of *3000 ft. above the sea-level, and is* 300 m. N.N.W. of Chinde. It is the headquarters of missionary societies, and is a station on the African Trans-Continental telegraph system. It has a Presbyterian church built by native labour.

Blantyre (Gaelic, warm retreat), a parish of Lanarkshire, Scotland, a few miles S.E. of Glasgow. The chief towns in it are High B. and Low B. High B. has in the neighbourhood Calderwood Castle, in Rothen Calderwater, a very picturesque building. *Coal-mining is the chief industry.* It has a pop. of 3000. Low B. is chiefly noteworthy for the fact that both David Livingstone *and his brother* Charles were born there, and worked as piecers in the local cotton mill. The remains of B. priory, *founded late in* the 13th century, are to be seen near by on the left bank of the Clyde. Coal mining and a little cotton-spinning are carried on. Pop. 2000.

Blaps, the name of a genus of black beetles which numbers more than 100 species. They are dark, wingless, and slow in movement; of nocturnal habits, they feed on dead vegetable matter, and possess the power of ejecting an acrid fluid with a ... several ...ecies is ...hyard ' beetle, which used to be considered as the harbinger of death. The species *B. sulcata* is cooked with butter and eaten by Turkish women, as they consider it an aid to the attainment of adiposity, which is regarded as a beauty.

Blarney, a small tn. in co. Cork, Ireland, *5 m. N.W. of Cork. It* contains an old castle which is built on the site of a still more ancient one built *in 1446 by Cormac McCarthy. The* noted ' B. stone,' which is supposed to render the person who kisses it as persuasive as the serpent, is situated about 20 ft. from the summit. The feat of kissing it requires some nerve, as the person essaying it has to be held by the legs and swing face downwards to reach the stone.

Blasewitz, a vil. of Saxony, 5 m. to the S.S.E. of Dresden, on the Elbe. Its *pop. is 1577.*

Blasius, or Blaise, St., Bishop of Sebaste in Asia Minor, was martyred *in the reign of Diocletian on Feb. 3,* 316. His day is still kept as a festival by the Roman Catholics, and by the ...astern Church on Feb. 11. ...tron saint of woolcombers, was said to be torn by their irons, and he is associated with diseases of the lungs and throat.

Blasphemy, besides being used to denote insulting and opprobrious speech in general, denotes also speech *of that kind offered to God or persons* or objects esteemed sacred. Among the canonists the definition of B. is *made to include the denying of God,* or the asserting of anything to be God which is not God. Blackstone describes B. at common law as comprising ' the denying the being or providence of God, contumelious reproaches of our Saviour Christ, profane scoffing at the Holy Scripture, or exposing it to contempt and ridicule.' The punishment is fine and imprisonment. The 9 Will. III. c. 35 enacts that if any person educated in or having made profession of the Christian religion should by writing, *printing, preaching,* teaching, or advised speaking deny any one of the persons of the Holy Trinity to be God, *or shall assert that there are more* Gods than one, or shall deny the Christian religion to be true, or the Holy Scripture to be of divine authority, he shall upon the first offence be rendered incapable of being a guardian or executor or of taking a legacy or deed of gift, and suffer three years' imprisonment. According to the decision in R. *v.* Carlisle the statute is cumulative in operation and in principle merely declaratory of the common law, although apostasy is constituted by the statute a distinct substantive offence included in B. But it has been held that the offence does not consist in an honest

questioning of the truths of the Christian religion, but rather in a wilful intention to pervert, insult, and mislead others by means of licentious and contumelious abuse applied to sacred subjects. The disputes of the learned upon particular controverted points of religion are not punished as B. (R. *v.* Woolston). Whether these latter dicta be sound common law or not, they are in harmony with the trend of public opinion against putting in active operation the law of B. in all its rigour. Smith's Act, 1813, relieves 'persons denying as therein mentioned' the doctrine of the Holy Trinity. Publications which assail in an indecent and malicious spirit Christianity or the Scriptures in language calculated and intended to shock the feelings and outrage the belief of mankind, are regarded as blasphemous libels (R. *v.* Bradlaugh). The law is rarely put in force. In 1911 Harry Boulter, a tailor, who was in the habit of speaking on Streatham Common on the subject of Atheism, and was prosecuted for conduct provoking a breach of the peace, and ordered to be of good behaviour for twelve months or go to prison for three months. The chief commissioner of police elected in that case to proceed as for a threatened breach of the peace, and not for an actual commission of breach or for B. At the Leeds Winter Assizes of 1912 two men, Stewart, an analytical chemist, and John William Gott, a purveyor, were sentenced to three and four months imprisonment respectively for B. In answer to questions put in the House of Commons the Home Secretary agreed that punishment was for the offensive method the men adopted in expressing their views, and because they knew those methods would lead to a breach of the peace.

Blass, Friedrich (1843-1907), Ger. classical scholar, born at Osnabrück, Hanover, professor at Kiel University from 1881 to 1892, and at Halle University after 1892. He ed. numerous classical texts, notably the orations of Æschines, Andocides, Antiphon, Demosthenes, Dinarchus, Hyperides, Isocrates, and Lycurgus, and contributed largely to philological papers. His other works include *Die attische Beredsamkeit*, 1887-98; *Die Aussprache des Griechischen*, 1888; *Plutarch, Tiberius, und Gaius Gracchus*, 1875; *Grammatik der neutestamentlichen Sprache*, 1896; *Philology of the Gospels*, 1898; *Bacchylidis Carmina*, 1898.

Blasting, the method of shattering or loosening masses of mineral by the discharge of an explosive. It is used both in excavation or tunnelling, where the material has no particular value, and in mining, where the material has to be recovered, often in a certain state of coherence. In B. for the purpose of loosening obstructing rock, a large charge of gun-cotton or nitro-glycerine, or a series of charges round a central core is used, the effect being to disturb the rock for a certain distance around a given point, the débris being then removed by ordinary pick or navvy work. In B. for minerals of economic value it is usually advisable to loosen the material along the natural lines of cleavage. Small charges are therefore used, and the material can then be removed in bulk without the admixture of foreign substances and the over-pulverisation that a shattering charge would cause. To effect the explosion a hole is drilled by hand or machinery to a depth of some feet, a cartridge of cylindrical form is inserted with the wire terminals hanging loose, the hole is 'tamped' or plugged up with clay or mud, the terminals connected with wires attached to a battery, and the battery carried to a safe distance off before the circuit is completed by a switch on the battery box.

Blasting Gelatine. *see* GELATINE.

Blastoderm, the first mass of primitive cells which forms round the protoplasm in the ovum.

Blastoids (Gk. βλαστός, germ, bud, εἶδος, form) are a class of fossil echinoderms which lived in the late Palæozoic time and are found in the Upper Silurian to the Carboniferous. They differ from most echinoderms in having no arms, and they have eight to ten groups of hydrospires on the radial and inter-radial plates. The calyx resembles a bud; hence the name. The genus *Pentremites* is typical of the B., and about twenty other genera have been discovered. *See* K. A. von Zittel's *Text-book of Paleontology*, vol. i., 1900; and R. E. Etheridge and P. H. Carpenter's *Catalogue of the Blastoidea in the Geological Department of the British Museum*, 1886.

Blatchford, Robert (*b.* 1851), the son of an actor, born at Maidstone on March 17. After being an apprentice to the brush-making, a soldier in the Dublin Fusiliers, and a clerk at Northwich, he drifted into journalism, and was connected with the *Sunday Chronicle* from 1885 to 1891. In the latter year he started the *Clarion*, and, chiefly under the *nom de plume* of 'Nunquam,' contributed many articles of a socialistic and agnostic character, which attracted wide attention. He has done more to popularise Socialism among British working people than any of his contemporaries. The purity of his English and the

simplicity and genial humour of his style have made his writings popular even among those who do not share his economic and religious views. His published works include: *Merrie England*, 1894; *Tommy Atkins*, 1896; *Britain for the British*, 1902; *God and My Neighbour*, 1903; and *Not Guilty, a Plea for the Bottom Dog*, 1905.

Blattidæ, a family of insects of the order Orthoptera, which includes the cockroaches, often improperly called black-beetles. There is a large number of species found in all lands as active and extremely voracious insects. The head is hidden by the thorax, and the antennæ are long and thread-like. The common cockroach of English kitchens is *Blatta* (or *Periplaneta*) *orientalis*, said to have come originally from Asia.

Blavatsky, Helena Petrovna (1831-91) (*née* Hahn), usually known as 'Madame B.,' was born at Ekaterinoslav, Russia, on July 31 (O.S.). She was married at the age of seventeen years, but left her husband after three months, and was wont in later years to refer to the marriage as nominal only. She travelled in Asia, S. America, Africa, and India, and on returning from her travels in 1858 she declared that she had gone through an initiation into esoteric Buddhism, and could perform supernatural feats by the aid of 'Mahatmas' or her spiritual tutors. In 1875 she founded the Theosophical Society, of which the objects are: 1. To form a nucleus of the Universal Brotherhood of Humanity without distinction of race, creed, sex, caste, or colour. 2. To encourage the study of comparative religion, philosophy, and science. 3. To investigate unexplained laws of nature and the powers latent in man. Her books, which include *The Secret Doctrine*, 1888; *Isis Unveiled*, 1877; and *Key to Theosophy*, 1891, are a curious mixture of magical and Cabbalistic love, Theosophy, and more or less esoteric Buddhism. There seems no doubt that she had resort to deceit in order to prove her claims, as was shown by the Society for Psychical Research in 1884. She died in London. *See* Theosophy.

Blavet River, the name of a coastal river of France, which rises in the Landeret Hills and flows into the Atlantic at Port Louis. It crosses the B. swamp, and the Scorff river flows into it at Lorient. The length of its course is about 87 m.

Blaydon a tn. in Durham, on the R. Tyne, 4½ m. S.W. of Newcastle, with which it is connected by a bridge. It has manufs. of bricks and bottles; lead is found in the neighbourhood, and there are collieries and iron foundries. Pop. 21,000.

Blaye (the anct. Blavia), a Fr. tn. in the dept. of Gironde, on the r. b. of the Gironde, 20 m. N.N.W. of Bordeaux. It has a trade in wine, brandy, and oil. Pop. 5500.

Blayney, Andrew Thomas, Baron (1770-1834), lieutenant-general, was gazetted major of the 89th regiment, part of which he had raised himself in 1794. He joined the Duke of York, who was fighting in Flanders, and experienced all the perils and misery of the retreat through Holland, 1794-5, but in many of the encounters he had gained signal distinction. After assisting Lord Cornwallis in terrorising the poor Irish peasantry, 1798, he helped in the reduction of Malta. He was with General Whitelocke at the regrettable capitulation of Buenos Ayres. During the Peninsular War he made a disastrous descent on Malaga. In his *Narrative of a forced Journey through Spain and France as a Prisoner of War*, 1810-14, he vividly describes his own experiences and the state of the two countries.

Blazon and Blazonry (Ger. *blasen*, blow), heraldic terms which originated with the custom of blowing a trumpet to announce a knight's entrance into the lists at a tournament; the knight's coat-of-arms was explained in heraldic phraseology by the heralds who called his name. Thus blazon and blazonry came to mean the art of describing a coat-of-arms in such a way that any one who possessed a technical knowledge could accurately portray it from the description. The following are the principles of blazonry. The field must be named first; it may be of one or more tinctures, whose arrangement again may vary. The charges follow in order of importance and distance from the field; the name of the charge is first given, then in succession the number, position, and tincture. Any ordinary, or a diminutive of an ordinary, is named first, except a chief, bordure, or canton, which are usually named last. The precedence is generally taken by a bordure or canton of these three, but when a bordure surrounds a chief the bordure is named last of all; when a chief covers a bordure the reverse is the case, and when a bend surmounts a chief it is named last. If the prin. charge is not in the centre of the field its position must be described; 'quarterly gules and or, in first quarter a star (mullet) argent,' for instance, is the blazonry of the coat-of-arms of De Vere, Earl of Oxford. When two or more of the same charge occur in a field, their position is understood to be as follows unless otherwise stated; two are

placed 'in pale,' one over the other; three in the form of a triangle on its apex. When an ordinary or its diminutive surmounts another charge it is not named first. The names of the tinctures are always given after the charges to which they refer, but if several consecutive charges are of the same tincture, this is given after the last one. The rules of blazonry have for their object explicituess and brevity, but periphrasis is resorted to in order to avoid repetition.

Bleaching, a process which involves the decomposition of colouring matter in any material, which therefore tends to become white. It is an important step in the preparation of many textiles for the market, partly because the whiteness is esteemed on account of its association with cleanliness, and, in the case of coloured goods, because it is necessary to get a quite neutral ground before the best effects of dyeing and colour printing can be obtained. The B. effects of the sun's rays has been observed from the earliest times, and sunlight still plays an important part in many branches of the industry. Certain chemicals are also employed, such as chlorine, hydrogen peroxide, and sulphur dioxide. The first two operate as oxidising agents and the last as a reducing agent, liberating hydrogen from water. B. was undoubtedly practised amongst the early Egyptians, and the whiteness of their linens was greatly esteemed by other nations. The Phœnicians also possessed the art, and were acquainted also with the cleansing effect of potashes, or the alkalis produced from the ashes of burnt plants. In Greece, Italy, and Persia white textiles were in great demand, but the mode of preparation probably did not go further than exposure to sunlight when the cloth was in a moist condition. In Great Britain it was customary up to the 18th century to send linen to Holland to be bleached, whence, paradoxically, the name Holland for unbleached linen. The Dutch process consisted of steeping the linen for several days in a lye of crude potashes, after which it was treated with butter-milk for some weeks. It was then spread out upon the grass in the sunshine and kept moistened. The whole process occupied several months, and naturally entailed the work being done in the summer months. This method was followed at bleach fields established in Scotland about 1730, but an improvement was instituted by Dr. Francis Horne of Edinburgh in 1756, who suggested the use of very dilute sulphuric acid instead of butter-milk. The result was a great shortening of B. process, as the souring took at most a day, and as this stage occurred about five or six times during the recurrent process, the time saved amounted to several weeks. The next great improvement was the application of chlorine to B. The properties of this gas had been investigated by Scheele in 1774, and in 1785 Berthollet suggested its use for the purpose of breaking down colouring matters in textiles. James Watt, who was acquainted with Berthollet, introduced the process into Scotland shortly afterwards, and it soon made its way also among the Lancashire manufacturers. The form in which it was most generally used was B. powder, which was introduced in 1799 by Charles Tennant, of Glasgow.

Cotton bleaching.—Raw cotton contains as impurities vegetable wax, colouring matter, seed husks, and other organic substances up to 5 per cent. by weight of the material. When it has passed through the loom it is much further contaminated by weaver's size, with which the warp is dressed for strengthening purpose, oil from the machinery, and other accidental impurities up to perhaps 20 per cent. by weight of the material. *If cotton is therefore bleached* in the raw state it is sufficient to treat it first with a warm solution of soda, after which a solution of B. powder is applied; the process being completed by souring with dilute sulphuric acid. The material is thoroughly washed after each stage of the process. In the case of woven goods, singeing is first employed to remove the nap, the material is then washed and afterwards boiled in milk of lime. The next stage is the 'grey sour,' when the lime is dissolved out by hydrochloric acid. The B., or 'chemicking,' follows, which means that the goods are run through B. powder solution. There is another washing, and the goods are finally treated with dilute sulphuric acid ('white sour') and washed.

Singeing is required to produce a smooth surface, and consists of burning off the projecting fibres by passing the material through a gas flame or over a hot plate. Gas singeing is used for goods which have an uneven surface, so that all the fibres come in contact with the flame, though, of course, only for a very short time. In plate singeing the pieces, sewn together, are drawn rapidly over two arched copper plates heated by furnaces beneath. Roller singeing consists of allowing the sewn strip to pass round a roller which revolves in the reverse direction. The roller is heated by a flame being drawn through the inside of the cylinder, and the advan-

tage of the process is that the cotton is continuously brought in contact with a freshly heated surface. The *grey wash* is carried on in a dash-wheel washing machine, a cylindrical box of four divisions into which the pieces are put. The revolving of the box causes the material to dash through the water against the sides of the machine, so that the required solution is effectively carried out. The *lime boil* is accomplished by passing the strip of pieces through milk of lime and into a bowking kier which is a strongly constructed cylinder capable of holding 3500 lbs. of cotton. The milk of lime is forced through the material by high-pressure steam to the bottom of the cylinder. The kiers are usually worked in pairs, so that the liquid can be forced from one kier to the other alternately. The lime decomposes the fatty substances in the material forming insoluble soaps which remain in the fabric after the subsequent washing. The *grey sour*, or treatment with sulphuric acid, dissolves out these substances, and after washing, the material is ready for treatment with chloride of lime, or *chemicking* in a washing-machine. The object of the *white sour*, or final treatment with sulphuric acid, is to dissolve out the lime in the B. powder so as to allow the chlorine to complete its B. action.

Linen bleaching.—The same principles are utilised in linen B. as in cotton B., but the process is much more tedious, and contains many repetitions of stages, together with the employment of 'crofting,' or the exposure of the moistened material to the action of sunlight. This prolongation of the process is due to the heavy percentage (20 per cent.) of impurity in the fibre, much of it very obstinate material to deal with. The fabric is, moreover, so close in texture and yet so liable to deterioration from the use of drastic reagents, that the solutions employed can only take effect by constant repetition. As the 'grassing' of the linen is a prominent feature in the B. process, the industry can only be carried on away from large towns, where the discolouring substances in the air would undo the work achieved by the long exposure to light.

Wool bleaching.—Wool, as received by the manufacturer, is usually in a very impure state, the unnecessary substances amounting to about 30 per cent. These consist of a natural wax coating the fibres, and known as 'yolk,' other exudations soluble in water and known as 'suint,' and the dirt which has accumulated since the last washing. The wool is treated with soap solution, which dissolves out the fat, while the water itself is sufficient to remove the other substances. The actual B. may be carried out by employing hydrogen peroxide, which, however, is somewhat expensive. Sulphur dioxide is more usually employed, either as fumes obtained from burning sulphur, or as the aqueous solution (sulphurous acid).

Silk bleaching.—Raw silk consists of the fibre proper and a gum-like substance, sericine. This latter amounts to about 20 per cent. by weight, and has to be removed by treatment with a strong soap solution. It is afterwards boiled in a weaker soap solution, rinsed, and dried. The B. is often carried out, as in the case of wool, by the use of sulphurous acid. Latterly, however, for tussore and fairly coarse silk, hydrogen peroxide is used.

Other material.—*Jute* is only partially bleached, as its fibres are easily disintegrated. Hypochlorite of soda is the usual B. agent. *Hemp* may also be half-bleached by the use of B. powder or hypochlorite of soda. *Straw* used for making hats is bleached with peroxide of hydrogen while the straw is in the form of plait. As considerable discoloration takes place during the shaping of hats, a further bleach is required, and is accomplished by treatment with sulphurous acid or hydrogen peroxide as before. *Wood* is bleached by being immersed in an alkaline solution of hydrogen peroxide. *Paper* is made of a variety of materials, including esparto grass, wood, straw, rags, etc. These are usually bleached when they are half made up by treatment with B. powder. It is necessary, however, in the case of paper to thoroughly remove the chlorine by subsequent treatment with a substance with a strong affinity for chlorine, as hypo-sulphate of lime.

Bleaching Powder, a bleaching agent and disinfectant obtained by the action of chlorine on slaked lime. It is manufactured on a large scale in alkali-works from the hydrochloric acid obtained during the production of salt-cake (*see* ALKALI). Chlorine is evolved from the hydrochloric acid by the action of manganese dioxide, and afterwards passed into chambers containing dry slaked lime. Some days are allowed to elapse for the absorption of the chlorine, which ultimately forms about 35 per cent. of the whole. The resulting product is a homogeneous white powder, which absorbs moisture from the air and decomposes when stored in close vessels. It dissolves in twenty parts of water.

Bleak, a small fresh-water fish belonging to the Cyprinidæ, in the

Physostomi div. of bony fishes, in which the air-bladder opens into the gullet. The common B., *Alburnus lucidus*, is a fish with a protruding jaw and an elongated body, generally from 5 to 7 in. in length. It is common in the European rivers N. of the Alps, and occurs in large shoals. It forms a great part of the diet of such fish as the pike, trout, etc. Artificial pearls are manufactured from the coating of its scales.

Blechnum, a genus of fern belonging to the order Polypodiaceæ. There is only one species found in Britain, and it has been seen in N. Africa and N. America also. Its popular name is the hard fern or northern fern, and its technical name *B. boreale* or *Lomaria spicant*.

Bleda, king of the Huns, was brother of the famous Attila. The two reigned together from 433 to 445, when Bleda died.

Bleeding, a discharge of blood occasioned by the rupture or cutting of arteries, veins, or capillaries. There may also be a general oozing from congested mucous surfaces, although no fissure in the walls of the vessels can be detected. Arterial B. is characterised by jerky movement and the bright scarlet colour of the fluid; in venous B. the fluid is dark purple and comes in a continuous stream; capillary B. is shown by a bright red colour and a gentle flow. The methods of stopping B. for first-aid purposes involve the elevation of the wounded part, the application of cold, and pressure by fingers or bandages at suitable points. If the B. is arterial, pressure must be applied to the artery between the heart and the wound, and if the artery is some distance below the surface, a severe ligature is necessary. Venous B. is met by pressure directly above the wound by a pad kept in position by bandages. Internal B. is best treated by the patient lying down and wet cloths being laid over the affected part. Severe hæmorrhage is in any case dangerous, and should be treated without waiting for the arrival of the surgeon. B. as a remedial measure is seldom resorted to nowadays as compared with its continual use centuries ago. The means adopted are venesection, cupping, and leeching. *Venesection*, or the cutting of a vein, is used to relieve the general engorgement of the pulmonary vessels after a chest injury and in other cases of suffocation. To relieve the blood pressure a vein in the forearm is opened. *Cupping* means withdrawing blood by means of the reduced air pressure in a heated cup placed over a puncture in the skin. It is not now used for extensive inflammation, but for local inflammations, as in ear troubles, meningitis, etc. *Leeches* are applied over prominences where pressure can afterwards be applied to stop the B. They may either be allowed to drop off of themselves or induced to do so by the application of salt.

Bleek, Friedrich (1793-1859), a Ger. biblical critic, was born at Ahrensbok, in Holstein, on July 4. He studied theology at Kiel and Berlin. He became a tutor at the latter university in 1818, and was made professor of theology in 1823. In 1829 he removed to Bonn, where he was also professor of theology, and where he remained till his death. His chief work is his commentary on the Hebrews, which is considered to be one of the first exegetical works of the 19th century. His *Introduction to the Holy Scriptures* (1860-2) has gone through several eds., and has been trans. into Eng., as have the *Lectures on the Apocalypse* (1875). Among his other works may be mentioned his commentaries on the Colossians, the Philemon and Ephesians, the Gospels, etc. All his works are marked by clear judgment supported by unpretentious but real learning.

Bleek, Wilhelm (1827-75), a Ger. [illegible]ich B., was [illegible]s. He joined [illegible] in 1854, but was obliged to return owing to ill-health. Joined the Bishop of Colenso in Natal in 1855, and spent some time studying the Kaffirs. He settled down at Cape Town and was made keeper of the Grey Library in 1861. Here he pursued his philological investigations till his death on Aug. 17, 1875. He was instrumental in assigning the great Bantu family to its proper ethnographical position, and was exceedingly well learned in the philology and folk-lore of the Bushmen and Hottentots. His works include a *Handbook of African, Australian, and Polynesian Philology* (3 vols. 1858-63), and his unfinished *Comparative Grammar of South African Languages*.

Bleiberg, a vil. in the Austrian duchy of Carinthia, 8 m. W. of Villach. It is situated in the valley of the Drave, near the celebrated Bleiberg (Lead Mountain). Pop. 900.

Bleibtreu, Georg (1828-92), a German battle-painter, born at Xanten, Rhenish Prussia. Pupil of Düsseldorf Academy, 1843-48, also later under Hildebrandt. His first success was with scenes from the Danish war. His battle-scenes from the wars of Frederick the Great and the German war of deliverance were also famous. In 1858 he went to Berlin; 1866 accompanied the Prussian army in the suite of Prince Frederick Charles; 1870 in

that of the Crown Prince; 1869 member of Berlin Academy. Among his works are: 'Battles of Kolding and Flensburg,' 1852; 'Battle of Grossbeeren on the Katzbach,' 1857; 'Battles of Aspern, Crefeld, storming Grimma Gate in Leipzig,' 1858: 'Episode from the Battle of Waterloo,' 1858; 'Crossing to Alsen, Battle of Königgrätz' (Berlin National Gallery); 'Surrender of Napoleon after Sedan.' 'Meeting of Moltke and Wimpffen,' 'Napoleon's Flight after Waterloo,' 1878; 'The Summons in 1813,' 1881 (Berlin Arsenal). *See* Brockhaus, iii., 156; Müller, 56; Rosenberg, *Berl. Malersch*, 157 (1879).

Bleibtreu, Karl (*b.* 1859), Ger. author, born at Berlin; educated there and in London; entered journalistic life, and ed. sev. papers. His work includes poetry, such as *Lyrisches Tagebuch*, 1885; *Lieder aus Tirol*, 1885; *Komische Lieder*, 1890; dramas, such as *Byron's Geheimnis*, 1901, and *Die Freimaurer*, 1902, and literary criticism, notably *Geschichte der Englischen Litteratur*, 1887.

Blekinge, the name of a province of Sweden, which is washed by the Baltic Sea on the E. and on the S. sides. It is one of the most beautiful, and one of the most interesting from an historical point of view, in Sweden. It belonged to Denmark, with the exception of 1332-60, till 1648, when it was united to Sweden. The chief town is Carlskrona. The area of B. is 1300 sq. m. Pop. 160,000.

Blench Holding, *see* BLANCH HOLDING.

Blende (Ger. *blenden*, to dazzle), the name given to a number of [illegible] in particular to [illegible] in the Fr. dept. of Yonne, situated 29 m. W.S.W. of Auxerre. It was here that Turenne gained the victory over the Prince de Condé in the year 1652.

Blenheim (Ger. *Blindheim*) is a small vil. in the Ger. kingdom of Bavaria on the l. b. of the Danube, a short distance below Hochstadt. It is only remarkable as being the scene of the defeat of [illegible] August 13, 1 [illegible] the Duke of [illegible] the Austriar [illegible]
The Fr. and Bavarians lost between thirty and forty thousand killed, wounded, and prisoners. Pop. of Blenheim is 800.

Blenheim, the name of the cap. of the Marlborough dist. of New Zealand, situated on the Waeran R., near the coast, 20 m. S. of Picton by rail.

Blenheim Dog, a variety of miniature spaniel much like the King Charles, but it has shorter ears and differs from it in colouring, being pure white with brown and red markings. It received its name from the estate of the Duke of Marlborough, where it was first bred.

Blenheim Park, the seat of the Duke of Marlborough, near Woodstock, Oxfordshire. It was presented [illegible] stock, which also formed part of the reward. The £500,000 voted for the presentation was found to be insufficient. Its architect was Sir John Vanbrugh, whose powers are amply proclaimed by the grandeur of the massive building, the length of whose front is 348 ft. The valuable collections of paintings and jewels and the fine library were sold by auction between 1875 and 1886. Of the pictures the National Gallery purchased, among others, the 'Ansidei Madonna' by Raphael for £70,000. The grounds are adorned by a triumphal arch and a column, 130 ft. high, supporting a statue of Marlborough. The area of the park is 2700 ac., and its boundaries 12 m. long. The trees are said to be arranged on a plan similar to the placing of Marlborough's men at Blenheim. The R. Glyme widens into an artificial lake, and is spanned by a large bridge.

Blenkinsop, John (1783-1831), a forerunner of Stephenson in the development of the locomotive, was born near Leeds. His locomotive was patented in 1811, its chief feature being a cog-wheel that fitted into a toothed rail. At a test at Hunslet, Leeds, on June 24, 1812, it covered 1¼ m. in 23 minutes, 'without the slightest accident.' B. died at Leeds.

Blennerhasset, Charlotte, Lady, Ger. biographer and essayist, born Countess Leyden at Munich, 1843. Married Sir Rowland B., 1870; studied at Munich *University*, winning title 'Doctor honoris causa,' 1898. She won a name for her biographies of *Frau von Staël*, 1887-89; and *Talleyrand*. Among her essays, many of which appeared in *Deutsche Rundschau*, may be mentioned: *George Eliot, Taine, Queen Victoria, D'Annunzio, Tennyson* (1899); *Die Ethik des modernen Romans* (in *Cosmopolis*, 1896). [illegible] *Marie* [illegible] 1903; [illegible]

Blennius, the chief genus of the acanthopterygious fishes of the family Blenniidæ. They are littoral fishes found in all temperate and tropical seas in great variety; they are of small size and live in shoals. The

blennies are distinguished by having the ventral placed before the pectoral fin, and it consists of one to three soft rays. *B. ocellaris*, butterfly blenny, is a British species.

Blennorrhœa, an excessive discharge of mucus.

Blenny, a fish belonging to the family Blennidæ. It is characterised by a long, somewhat cylindrical body, generally smooth, though sometimes covered with minute scales, and more often slimy. Along the back for the greater part are dorsal fins, sometimes furnished with protruding spinous rays. There are few British specimens. Over each eye there is often a tentacle. Their appetite is carnivorous and ferocious. Clambering over sea-weed and similar obstacles is accomplished by means of their ventricle fins. They travel in small shoals. They are seldom used for food.

Blepsias, a genus of small fishes allied to the miller's thumbs and bullheads which inhabit the shores of N. regions. They belong to the Cottidæ family of acanthopterygious fishes and are of no food value. *B. rillosus* is a native of the Aleutian Is.

Blériot, Louis, Fr. aviator, born at Cambrai, 1872. Pilot of Aero Club de France, and inventor of B. monoplane, which is one of the smallest in existence. It takes up no more space with wings folded than a medium-sized motor-car. B.'s flight across Eng. Channel (Calais to Dover, 31 m., in 37 min.) in his monoplane, July 25, 1909, marked an epoch in aviation and in the history of 20th century. He was the first to cross the Channel by aeroplane, and has won international fame by his daring feats.

Bles, Hendrik (1480–*c.*1521), Flemish artist, born at Bouvignes. Is thought to have studied at Antwerp under Joachim Patenier, whose style he imitated. His manner is hard and dry, but his figures well drawn. He generally painted landscapes, with scriptural subjects introduced, and instead of signing his name painted an owl in one corner. He is represented in the National Gallery, London, by a 'Christ on the Cross' and a 'Magdalen.' Other works by him are at Berlin, the Uffizi Gallery, Florence, the Pinacothek, Munich, and Venice.

Blessington, Marguerite, Countess of (1789–1849). She was a native of Knockbut, Tipperary. Her father was Edmund Power, a small landowner. She was compelled to marry Captain Farmer when she was only fourteen. His worthlessness caused her to leave him after three months. Not long after his death she married Charles Gardiner, Earl of Blessington, in 1818. In 1822 she toured the Continent, and while at Genoa made the acquaintance of many distinguished men, among them Byron. This acquaintance ripened into a great friendship. Till 1829, the year of her husband's death, she lived at Paris, and here as in London she became the centre of all the most eminent contributors to music, art, and literature. With the fortune left her she established a court at Kensington, at the princely Gore House. From 1822 an acquaintanceship with the Count d'Orsay had gradually assumed a more intimate intercourse, and later Society refused to recognise her on account of their irregular union. This circumstance, and a vast accumulation of unpayable debts, forced them to abandon their responsibilities, and they crossed to Paris in 1849. During the previous twenty years she had written a number of novels of no literary value. She died of apoplexy on June 4. Her *Conversations with Byron* had some effect in lessening the condemnatory attitude his countrymen had adopted towards him.

Bletchingley, a tn. of Surrey of some antiquity. It is 5 m. N.E. of Reigate. Fuller's earth is raised in the neighbourhood. Pop. under 2000.

Bletchley, a par. and township of N.E. Buckinghamshire, 45 m. N.W. of London. It has a pop. of 2946.

Bletting is the first stage in the decomposition of ripe fruits, when *bleds*, or rotten spots, first appear on them. Some fruits, such as the medlar, are kept until they reach this stage to improve their flavour.

Blewfields, *see* BLUEFIELDS RIVER.

Blicher, Steen Steensen (1782–1848), novelist and poet of Denmark, born Oct. 11, at Viborg. He was educated at Copenhagen. In 1819 he became pastor at Thorning, and in 1826 at Spendrup, Jutland. On March 26 he died at Spendrup. Between the years 1807-9 he trans. *Ossian*, and became widely known as a consequence, but the appearance of *Sneeklokken* (1826) and *Jydske Romanzer* earned him a popularity still greater. The publication of *Nationalnoveller* produced an effect more immediate than all his previous works. As a poet he is essentially national, and his works are full of tenderness and philosophic thought.

Blickling Homilies, so called because MS. is preserved at Blickling Hall, Norfolk, were possibly due to religious revival and foundation of monasteries about A.D. 959. They are nineteen in number, some incomplete, others only fragments, the earlier ones being regular sermons, the later largely of a narrative character based on legendary sources.

Their style marks the transition between the prose of Ælfred and that of Ælfric. *St. Paul's Vision* bears some resemblance to the passage in *Beowulf* describing the groves near Grendel's home, but similar descriptions occur in many poems of the period. The homilies may be by various authors, and written at different periods, but probably they belong to the close of the 10th century. They refer to the belief that the year 1000 was to be the end of the world. Morris has ed. them for Early Eng. Text Society, 1874-80. *See* Earle's *A.S. Literature*, 1884; *Cambridge History of English Literature* (vol. i.); Wülker's *Grundriss zur Geschichte der A.S. Literatur*.

Blida, a tn. of Algeria connected with Algiers by rail, and 32 m. S.W. of that tn. It possesses prolific orange groves, while other products include cotton, raisins, grain, tobacco, and cork-wood. Earthquake visitations occurred in 1828 and 1867. Its pop. in 1906 was 16,866.

Bligh, William (1754-1817), an English admiral, born of a good old Cornish family. His name is usually connected with the mutiny of the *Bounty*. He sailed with Cook on his second voyage as sailing master, and during this voyage bread fruit was discovered at Tahiti; from this discovery he received his nick-name Bread-fruit Bligh. After seeing some active service he was sent back in command of the *Bounty* to introduce the bread fruit plant into the W. Indies from Tahiti. He stayed at Tahiti for some six months, and during that time his men became so demoralised that on sailing for the W. Indies his crew mutinied, and he and his officers were cast adrift. After a voyage of over 4000 m. in an open boat they managed to reach Timor. On his return to England in 1790 he was appointed to the *Providence*, and managed at last to carry out his original project. He was present at the mutiny at the Nore in 1797, and later fought under Duncan at Camperdown, being present also and specially mentioned at the Battle of Copenhagen. In 1805 he was appointed governor of New S. Wales, but his severity led to mutiny, and for two years he was imprisoned. The officer who led the revolt was later brought home and cashiered. In 1811 he returned to England and was made first a rear-admiral, and later a vice-admiral. He died in London after a courageous but somewhat stormy career.

Blighia, a genus of plants named after Captain William Bligh, R.N., belonging to the order Sapindaceæ. *B. sapida*, the akee-tree, is the sole species, and is a native of Guinea. It is cultivated for its fruit, the aril of the seed is pulpy, and has a pleasant subacid flavour.

Blight, a disease common to cultivated plants, particularly cereals and grasses. The term has been used to cover many forms of disease, irrespective of their cause, and is specially applied to those ailments which seize the plant before maturity.

Blimbing, otherwise **Bilimbi**, a tree indigenous to the E. Indies. It is a member of the Oxalidaceæ. Its refreshing, wholesome fruit justifies its extensive cultivation in the Antilles.

Blind. *Blindness and causes of blindness.*—The B., who number a greater percentage of the total population than might be supposed, are so often subjected to a life of dependence and poverty that the civilised world acclaims no less the progress made by *medical science in the prevention of* the affliction than the advance in the development of special systems of education putting the B. in the way of earning a livelihood for themselves. It is calculated that in countries lying within the temperate zones about one person in every 1000 is B., while in warmer climates the proportion is much higher; in India it is about one in 600, while in Egypt, till recent years, it was no less than one in 50. In the United Kingdom, where the census of 1901 shows 25,317 B. persons, medical science concurs in the opinion that one-third at least of the cases could by proper precautionary measures have been prevented. The term 'blindness' indicates absolute loss of vision, and does not, in strict medical parlance, include that partial loss of vision or dimness which is known as amaurosis. This latter disease is a weakness of the eyes not proceeding from the cornea or the interior of the eye, but arising from diseases which, though they do ultimately paralyse the optic nerve, are not at first directly connected with it. Amaurosis chiefly afflicts the aged, but may be the consequence of strabismus or squint.

Causes of blindness.—Blindness in many cases is congenital, but results in a much greater degree from disease, accident, and old age. The principal inducing diseases are purulent ophthalmia, scarlet fever, cataract, scrofula, *small-pox, measles, and amaurosis.* Many business occupations have an injurious effect upon the eyes, and bef[illegible] prevalence of [illegible] print by gasli[illegible] prolific causes of blindness. Hereditary blindness is not frequent, though it has a tendency to develop itself in

families. Medical experience, however, abundantly demonstrates the important fact that blindness, like insanity, often results from intermarriages of first cousins, of uncles and nieces, and other relatives. Loss of vision from small-pox is now, owing to vaccination, not often met with. Without a doubt the great majority of cases of blindness owe their origin to infantile purulent ophthalmia or inflammation of the eye, arising from inoculation at birth with some hurtful foreign substance. Medical opinion lays the greatest emphasis on the preventability of blindness from this cause, and attributes that consequence mainly to neglect and dirt. Pathologically, ophthalmia of infancy is a contagious germ disease in the vast majority of cases absolutely curable by injecting silver salt, usually silver nitrate, into the eyes of a new-born infant. In the U.S.A., as a result of the confirmation of these facts, ophthalmia neonatorum, or inflammation of the eyes of the new-born, is a disease the existence of which must be notified at once to the proper authorities. Trachoma is also a cause of blindness. This disease, which is one of the many forms of conjunctivitis, or inflammation of the conjunctiva of the eye, is characterised by the 'granular' appearance of the inner surface of the eyelids, due to the presence of granular semi-transparent bodies, known as trachoma, or follicular granulations. Want of cleanliness is a factor in the propagation of this disease, which is commonly to be found in the eyelids of persons who live herded together under insanitary conditions of living, *e.g.* in camps or ill-regulated schools. Soldiers were formerly great sufferers, and it is recorded that hardly any of the soldiers of Napoleon's army in Egypt escaped the disease, the insanitary camp life being accentuated by the dust and dryness of the air. Glaucoma, or atrophy of the optic nerve, accounts for many cases of blindness. The disease is named from the pupil presenting a clouded aspect of a greenish colour. Most cases can be treated surgically if the operation be performed sufficiently early. In the more chronic forms, however, the operation will seldom do more than preserve what amount of sight is still retained. Sympathetic ophthalmia, or inflammation of an eye due to the injury of the other eye, is also a very common cause of total blindness, if the injured eye be not promptly removed. Myopia, or short sight, produced generally by too great convexity of the cornea due to over use of the eyes on minute objects, may have serious results. As a rule the defect is diminished with increasing years.

Census of the blind.—In 1851, when for the first time in this country inquiry was made into the census of the B., they were found to number one in 979 in Great Britain and Ireland. In 1861 there were 19,352 B. in England and Wales, or one B. person to every 1037 persons; in Scotland, 2820, or one to 1086; and in Ireland, 6879, or one to 643; total, 29,248, or one to 994. The very high average in Ireland was ascertained to be due to the several outbreaks of epidemic ophthalmia in that country during the 150 years preceding 1870 and the effects of the great 'epidemic constitution' so marked by the failure of the potato and the ensuing famines during the years 1845-52. In the thirteen years from 1849 to 1861 the cases of ophthalmia in the workhouses, according to the Irish Poor Law Commissioners, were little short of 200,000. For the same period the total B. in U.S.A. was only 12,631, or one in 2499, a remarkable figure when we reflect that the average in the temperate regions of the globe is something like one in 1300. The States' immunity from small-pox when that disease was rife in this country, before the days of the vaccination laws, will do no more than account for a part of this great disparity between ourselves and the U.S.A. There has, however, been a hopeful decrease in the proportion of B. to seeing persons in every census, though the rate of decrease is by no means constant, and this decrease is due to a wider knowledge of the nature, means of prevention, and treatment of purulent or other forms of ophthalmia or inflammation. In 1871 the total was 21,590, *i.e.* 951 per million of population, or one in 1052; in 1881, 22,832, *i.e.* 879 per million of population, or one in 1138; in 1891, 23,467, *i.e.* 809 per million of population, or one in 1236; in 1901, 25,317, *i.e.* 778 per million of population, or one in 1285. It is noteworthy that in Holland in 1869 the proportion was one to 2247; Denmark, in 1870, one to 1428; Germany, in 1885, one to 1150; and France, in 1883, one to 1180; the figures in each case being the most recent available. On the whole this country compares favourably enough with France and Germany, but not with Holland, Denmark, the U.S.A., and other countries in the temperate zone. It is suggested that the difference between the three great European nations and the U.S.A. is to be sought in the greater proportion of persons working in dangerous occupations to total population than is the case in America.

Institutions for the blind.—Before the 18th century there can be little doubt that no organised scientific effort for the relief of the B. ever manifested itself in the shape of responsible institutions either in this country or elsewhere. It seems to have been assumed on all hands that the condition of the B. was without hope, and as a class they were never taken in hand and taught to make themselves less dependent for their whole future on the charity of others than the nature of their afflictions actually warranted. The first regularly organised establishment for the relief of the B. was the Hôpital Impérial des Quinze-Vingts in Paris, founded by St. Louis in 1260 as an asylum for 300 of his soldiers who had lost their sight in the E. This institution, its capacity trebled, is still in existence, but no instruction was ever imparted to its B. inmates. The first successful effort in systematic instruction was made in Paris by Valentin Haüy, whose disgust, it is said, was so excited by the public contumely to which the more ribald elements of the Parisian common folk subjected the pauper B., that he set about devising means for rendering them, as a class, less helpless. Inspired by the success of the celebrated Abbé de L'Epée in the education of the deaf and dumb, Haüy believed that equally happy results could be effected for the B., and it seems soon to have occurred to him that the most feasible method of instruction was by means of letters formed and printed in relief. The first outcome of Haüy's efforts were, in 1784, a book for the B., and the foundation, under the patronage of the Philanthropic Society, of the Institut des Jeunes Aveugles, in Paris, organised under the immediate charge of Haüy himself. In 1786 Haüy gave an exhibition of the attainments of his twenty-four pupils before the king and royal family at Versailles, when the institution was placed on a more permanent footing by the royal bounty. Later, he was invited by the Russian Emperor to St. Peter founding city. In digent B. institutio tions of a B. man named Edward Rushton. This school was speedily followed in 1793 by the Royal Blind Asylum in Edinburgh. After that the establishment of institutions for the B. occurs at intervals averaging no more than two or three years all over the United Kingdom up to 1879. The majority of them, however, are regarded primarily as asylums and not educational establishments at all. There has been a similar progress in the U.S.A., but on a more scientific scale, for in that country every state in the Union has long since made some provision for the education of its B. In 1869 was founded in England the British and Foreign Blind Association, to which body and in a lesser degree, to the Royal Normal College of Music, Norwood, and the Worcester College for the B. sons of gentlemen, are due to a considerable extent the improvement and greater harmony in the prevalent methods of education of the blind.

Later development of institutions and associations.—In England and Wales in 1907 there were twenty-four resident schools and over forty workshops for the B. In addition there were forty-six home teaching societies who send teachers to visit the B. in their homes and lend embossed books. The National Lending Library, founded in 1882, holds now over 5000 vols. in various types for the B. There are also thirty-six pension societies, chief among which are the Royal Blind Pension Society, Society for Granting Annuities to the Poor Adult Blind, National Blind Relief Society, Clothworkers' and Cordwainers' Companies, Hetherington's Charity, and others, while the Gardner Trust administers the income of a bequest of £300,000 left by a Mr. Henry Gardner in 1879 for the relief of the blind.

Education and training of the blind.—The great majority of the B. in this or any country belongs to the poorer classes to whom life is an uphill struggle under the most favourable circumstances. But when overweighted in the race by the loss of sight, they must fail unless some special provision be made to facilitate their acquisition of knowledge, and to diminish the difficulties which lie in the way of making them a self-sustaining class. The B. can best be assisted by placing them as early as possible under the most favourable circumstances to help themselves. It is uneconomical not to give the B. the best education of its kind in the trade r profession they can best follow. It an outworn fallacy to suppose that y a sort of law of compensation the ther senses of the B. are keener than ose of the seeing. The senses of nearing and touch must be developed before they can be any real substitute for sight, and the earlier such development is begun, the better for the future welfare of the B. person. Nor again does the normal environment of the B. tend in any way to promote the cultivation of an active self-reliance or foster a spirit of independence. The misplaced kindness of friends accentuates the natural apathy

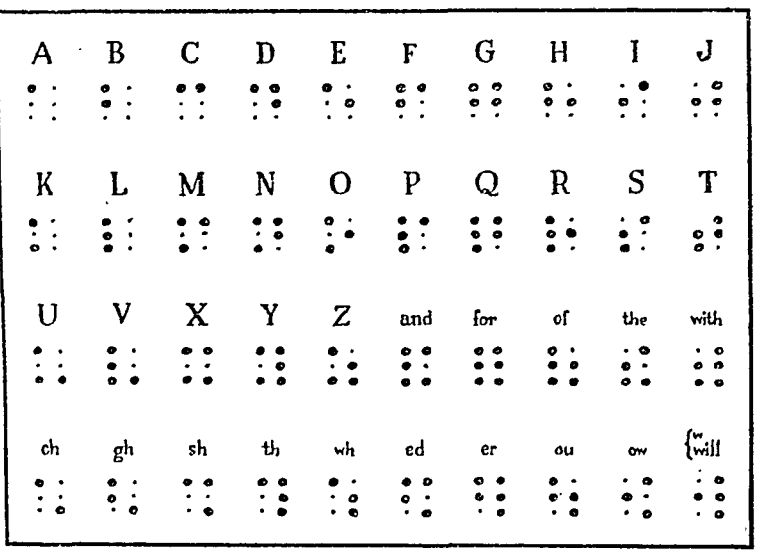
of the youthful B. Added to which, the vitality of the B. appears from reliable actuarial calculations to be below that of the average seeing person, and though it cannot be asserted that this lack of energy, and not the want of sight, causes so many failures, yet there is this element of truth in the assertion, that under proper physical and mental training a very high proportion of the B. can become either wholly or partly independent of the help of others for their livelihood. The spirit of the times has for the last forty years been entirely opposed to the purely charitable as against the economic treatment of the B., and to the idea of continually increasing the size of B. asylums and thereby making ever larger demands on the public funds. For those B. who for various reasons can never maintain themselves fully—and very few who have become B. late in life can ever do so—there will always be room for charity: but it is now recognised that most of the young B. ought to receive such an education as will fit them to become useful members of society. England, however, lagged far behind America and other countries in the practical recognition of this economic truth, and even now our legislation is extremely defective in that it makes no provision for other than elementary education. Indeed, in the sense that everything is left to individual effort England is still a long way behind America and other countries in the organised training of the B., and in this respect differs even from its own colonies. An efficient system of education for the B. must be founded on an adequate course of physical development. With care the B. children can soon adapt themselves without undue risk to a number of the modes of recreation of seeing children, *e.g.* swimming, jumping, swings, skittle-alleys, roller-skating, skipping, rowing, and so forth. A sound school curriculum should provide for classes graded to meet the requirements of various ages. When the B. child is about fourteen years of age some opinion can be formed as to whether its aptitude lies in the direction of mechanical work or handicrafts, or whether it has ability in the direction of general business or even something higher. Experience shows that the chief vocations of the B. comprise organists, teachers of music (America chiefly), organ and piano tuners, basket-working, making of brushes and brooms, the making of new and remaking of old bedding, mat-making, cork-fender making, chair-caning, mattress-making, wire-making, and various forms of plaiting and, more especially for women, knitting, sewing, crocheting, and the making of fancy baskets and brushes. The opening up of a musical education as a field for the B. has in some countries, notably in America, been attended with great success.

[illegible] land up to 1869
[illegible] ystem of reading
B., a system peculiarly favourable for musical notation, may explain England's backwardness in this respect. However, the introduction into this country of the Braille system (*see* below), resulted in the establishment in 1872 at Norwood of the Royal Normal College and Academy of Music for the Blind. The college embraces three distinct depts.: (1) General education; (2) Science and practice of music; and (3) Pianoforte tuning. Special care is bestowed on the intellectual training of the pupils, experience having proved that whatever the talent of the B. pupil for music, he will only become self-supporting where his musical training has had an adequate foundation in general education. All branches of musical instruction are given, and special attention is paid to the art of teaching. In the pianoforte tuning dept., pupils are trained who have passed the age at which they might have become qualified for profitable employment in other depts. A prolonged course of careful training is, however, as necessary in this dept. as in the purely musical, to enable the pupil to become self-supporting. In France B. organists, tuners, and teachers have been turned out in considerable numbers by the Institution Impériale des Jeunes Aveugles, and become independent men, many exercising highly lucrative professions. In the U.S.A., where the lot of the B. is socially immeasurably superior to what it would be in England or even France, large numbers of B. persons become notable scholars and musicians. It is recognised in that country, however, that whether in the training of the B. for a musical or any other professional career, or for competition in the labour world, first-rate masters, appliances, and institutions are required, and as liberal an education as that provided by the state for seeing people, whether it costs more *per capita* or not. Practically every country in Europe, except Great Britain, and even the Eng. colonies, provide for the education of the B. by taxation. In regard to schools generally, it is conceded that boarding schools are more to be desired than day schools, home influence being prejudicial from the point of view of education; for the B. child is generally treated at home differently from the

seeing children: a similar objection applies to the mingling in one class of B. and seeing children, the result often being that the memory of the B. child is developed at the expense of its other faculties. The habit of uniting for avowed economic reasons the B. with the deaf and dumb in certain asylums is unsound policy. The acquaintances ripen into intimacy with dire results, apart from the fact that the treatment for the two classes of afflicted should obviously be differentiated. Recreation and healthful surroundings are a *sine quâ non*, but more especially in the case of those B. children whose vitality, whether congenitally or owing to neglect, want of food, etc., is lower than that of the average child.

Types and appliances.—The idea of enabling the B. to read by touch is an old one, which would naturally suggest itself to all who desired to assist them in the attainment of knowledge. The first attempts at its practical application were made as far back as the 16th century, but were not attended by any great measure of success. The pioneer in the art of stamping characters on paper in relief was Haüy, who, in printing his first book in 1784, used the italic form of the Rom. letter. In 1832 Sir Charles Lowther, obtaining some types of this kind from France, printed some parts of the Bible with his own hand. The use of the Rom. character, however, is attended with certain disadvantages, and a long controversy between its advocates and those of Fry's type, stenographic, and point systems, has resulted in the abandonment of the Rom. characters in favour either of purely arbitrary signs or of signs which in certain cases retain the crude forms of Rom. capitals. For one thing the Rom. characters were not sufficiently distinct to the touch to be easily legible by its aid alone. Hence, in 1834, Gall [illegible] a new character founde Rom. capitals of curves. A and others, especially in America, invented and employed other modifications of the Rom. letters; but all of them, including Dr. Howe's use of small English letters without capitals and with angles for curves, are open to the same objection. They do not fulfil to the finger the promise they make to the eye. It is only with great difficulty that they are mastered by those who become B. in middle life. Doubtless a few of the B., chiefly among those congenitally B. or B. from early childhood, have developed an extraordinary sensibility of touch; but acuteness of touch is not natural to the B. by any means, and can only be developed by assiduous practice, and is not to be cultivated in a high degree by other than those who, being exempt from necessity for manual labour, can keep the skin of the finger tips in a condition of softness and delicacy. But even when due allowance is made for increased delicacy of touch, it may still be taken as a fact that the Rom. character, in all its modifications, is read by the B. with difficulty, and in proof of this the experience of American States schools may be appealed to. According to annual reports furnished to the States legislatures in 1868, among the pupils at those schools where a Roman letter is used, and after five years' instruction, one-third read fluently, one-third imperfectly, spelling the words letter by letter, and one-third failed entirely. At the Missouri Institution, on the other hand, where Braille's dotted character was employed, two-thirds of the pupils could read fluently, and one-third imperfectly, while no failures were recorded. We have had the advantage of no similar statistics in England, but as indicated above, the same practical difficulties have been felt. Dr. Fry's alphabet of ordinary capitals without their small strokes, invented in 1832, Taylor's and Alston's books in Fry's type in 1836, were the last words in Roman. In 1838 commences in England the era of arbitrary signs. Some of these are frankly shorthand—phonetic or stenographic. Others consist of rudimentary Rom. characters, or combinations of mere symbols and rudimentary Rom. capitals. The Lucas type is based upon ordinary shorthand, the [illegible] letters of the being used whe Frere phonetic system the signs represent vocal sounds. Both systems render the books printed in them cheaper and less bulky than those in which common type is used, but they present great and often insurmountable difficulties to the uneducated adult B. Dr. Moon, himself a B. man, devised in 1847 a system in which many of the Rom. letters are retained in simplified or rudimentary forms, while those which are more complicated are replaced by Frere's simple linear signs, any infringement of the latter's system being avoided by making the purely arbitrary signs selected represent different letters to those which they are made to represent by Frere. His method has the great recommendation of being very easy to acquire; but the books are bulky, which makes reading a slow process, and renders the cost of production very great. In Frere's system the lines are read alternately from left to

right and from right to left, the finger on reaching the end of the first line traversing a vertical arc to the left end or beginning of the ne t line, the letters of which are all reversed. Moon borrows the reversal of the alternate line from Frere, but does not reverse the letters themselves. Moon's type is still largely used by home teaching societies, being, from its simplicity, more adapted to the requirements of the dull or uneducated than that which is known as the point system. But practically all the other 'line' types have disappeared before the advance of the 'point' or dotted system. In the transition period, however, there was much confusion, any B. person, who had painfully acquired the power of reading one system, having to repeat his labour in order to master another, so as to be able to buy the very limited literature in embossed type on the market. In 1869, however, was formed the British and Foreign Blind Association, which included among its members men of the highest ability and social standing. Five of the six gentlemen who at that time formed the executive council were totally B., and the sixth was partially so. All six were able to read by touch at least three systems, and were pledged to, or pecuniarily interested in, none. The association, after extensive and persevering inquiries, came to the conclusion that the system which best met the requirements of the B. was the dotted system of M. Braille. That system was introduced into the Institution des Jeunes Aveugles in 1834, and steadily grew in favour until there was scarcely a country in the civilised world in which it was not widely known and used, while at the same time a prejudiced opposition brought it about that it was scarcely heard of in the United Kingdom until 1869. The Braille dotted system, the introduction of which into this country was promoted by Dr. Armytage, of the British and Foreign Blind Association, was invented by Louis Braille, a pupil, and afterwards a professor, of the Institution Nationale des Jeunes Aveugles, Paris. The basis or root form of Braille's character is furnished by six dots arranged in three horizontal pairs ⠿, and every letter of the alphabet is represented by the omission of something from this root form. The omissions are regulated on the most simple system For all the first ten letters, the two lower dots are omitted altogether, each letter being formed by the two upper pairs or by some further omissions from them. The next ten letters are formed by adding the left-hand dot of the lower pair to the former combinations, *e.g.* B is represented by ⠃ L by ⠇, C by ⠉, and M by ⠍, and so on. The remaining letters re-



BRAILLE DOTTED SYSTEM

quire both dots of the lower pair. The simpler forms when standing alone represent stops, and when following a particular prefix, figures. In all there are sixty-three possible combinations. The same system is applied to music, and the introduction into this country of a good system of embossed musical notation lessened the great difference previously existing between the prospects of B. musical pupils in this country, and those of America or France. In America there exist at least two modifications of the point type, viz. the New York point and American Braille, in which the most frequently recurring letters, *e.g.* E, S, T, A, are represented by the least number of dots. For working by this method a simple frame with a plate of zinc or other metal has been perfected. The paper is kept in position over the plate by strips of other metal, and the worker with his stilet makes the necessary indentations in the paper through the perforations in the securing bands of metal, which, besides holding the paper firm, guide the writer's hand. When a line is completed, the bands are placed lower, and the writer proceeds as before. The superintendent of the Jacksonville School for the B., a Mr. F. Hall, has recently brought out a Braille typewriter, and stereotype plate-maker, by which thin copper plates can be embossed and the requisite number of copies printed. An automatic Braille typewriter has been brought out in Germany, while a Mr. Wayne of Birmingham has constructed a cheaper Braille writer. In addition to these and kindred inventions, many boards have been made to facilitate the working out by the B. of arithmetical problems, the most up-to-date of which is that introduced by the late Rev. W. Taylor, containing a number of star-shaped holes, into which the student can fit a square pin in eight different positions. The board is effective also for algebra.

Some notable blind persons.—John, King of Bohemia, who died fighting valiantly; Ziska, the one-eyed, who lost his remaining eye in battle but continued to fight for Bohemia; Scapinelli, the B. philologist, and one of the most accomplished scholars of his day; Count de Pagan, who studied fortification and geometry; Dr. Nicholas Saunderson, lecturer on optics, and professor of mathematics in Cambridge University; Sir John Fielding, half-brother of the novelist, and chief magistrate of Bow Street Police Court; Hueber, an eminent naturalist and inventor of glass beehives; James Holman, who is said to have travelled without an attendant through a large portion of Europe, penetrated 5000 m. into Russian dominions, performed a voyage round the world, and actually on one occasion saved the ship by taking the helm; John Milton, the poet; Dr. William Moon, inventor of the Moon type; Henry Fawcett, professor of political economy at Cambridge University and postmaster-general; Louis Braille, inventor of the Braille type; Rev. Geo. Matheson, preacher and writer of the Church of Scotland; Prescott, the American historian; Alexander Rodenbach, Belgian statesman; Leonard Euler, astronomer.

Bibliography.—E. Fuchs, *Causes and Prevention*, 1885; B. G. Johns, *Blind People*, 1867; W. H. Levy, *Blindness*, etc., 1872.

Blind, Karl (1826-1907), author and revolutionist of Germany, was born at Mannheim, and educated for the law at Heidelberg. He took a sufficiently active part in the rising in S. Germany of 1848 to be condemned to imprisonment for eight years; but his liberation by the people during his journey to Mainz prevented the execution of the sentence. Subsequently during the inevitable reaction he found himself compelled to fly first to Belgium and later to seek safety in England, where his revolutionary activities continued. T[illegible] ment hac[illegible] his effort[illegible] Ger. freedom. His works are political,

The Ascent of Man is an epic upon revolution. She was born in 1841 and died in 1896.

Blind, Mathilde (1841-96), poetess, adopted the name of her stepfather, Karl B., who played a conspicuous part in the Baden insurrection of 1848-9. At different periods she travelled in Switzerland, Egypt, and Italy, and it was her visits to Scotland that inspired her to write two long poems, *The Prophecy of St. Oran*, 1881, and *The Heather on Fire*, 1886, which is a passionate outcry against the Highland evictions. In her epic, *The Ascent of Man*, 1888, she handles so vast a theme as Darwin's theory of evolution. As a writer of biography she is remembered for her *George Eliot*, 1883, and *Madame Roland*, 1886, whilst she showed her gift for translation in her Eng. renderings of Strauss' *The Old Faith and New*, 1873-4, and *The Journal of Marie Bashkirtseff*, 1890. At her death she bequeathed her property to Newnham

College, Cambridge. The conscious effort that mars her more ambitious works is overcome in her sonnets by her broad humanity.

Blindage is a screen constructed of earth and timber, or other available materials, which soldiers build to protect themselves against the enemy's fire when they are in a trench.

Blind Spot, that part of the retina or internal nervous coating of the eyeball where the optic nerve pierces through from the rear. The nerve fibres not having spread out at this point, light falling thereon conveys no impression; so that if a small object is so placed that the rays of light from it fall only upon this area it is not perceived as being in the field of vision.

Blindstory, in Gothic architecture, another name for the triforium of a church. It is directly opposed to the clerestory. It consists of a gallery situated immediately above the nave of a basilica or church. In some buildings the B. extends for the entire length of the aisle, while sometimes it is nothing more than a narrow gallery against the roof of the nave. It serves the purpose of a flying buttress to counteract the thrust of the central vault.

Blind-worm, or slow-worm, a worm-like creature usually about 12 in. long, of which length half is tail. Internal traces of limbs indicate its relation to the lizard, particularly those of the skink family. Its nostrils are provided with shields, while its eyes are protected by scaly and movable eyelids. It possesses long and pointed teeth which incline backwards. The colour depends upon the age and varies a great deal accordingly, but usually the adult is brown above and black underneath, while its young are white with a black stripe running along the centre of the back. They inhabit bushes and feed upon earth-worms and slugs. Their bite is quite harmless. Timidity is the chief trait of their character, and their fright often causes a contraction of the muscles resulting in a rigidity so tense that endeavours to bend the creature often cause breakage. They hibernate during winter in groups of about a score.

Bliss, Frederick Jones, American archæologist and explorer, *b.* in Syria, 1859. Graduated at Amherst College and Union Theological Seminary, New York. B. pursued independent researches in Syria; 1890-1900 became explorer to Palestine Exploration Fund, conducting excavations at Tell-el-Hesy (Lachish) and Jerusalem, discovering there the site of a city. B. has discovered much about pre-Christian pottery. Ely lecturer, 1903; Bross lecturer, 1908. His works include *A Mound of Many Cities; Excavations at Jerusalem*, 1894-7; *Excavations in Palestine*.

Bliss, Philip (1787-1857), antiquary, was born at Chipping Sodbury, Glos. He held various university posts at Oxford, including that of registrar of the university, 1824-53. His best known work is his ed. of Anthony à Wood's *Athenæ Oxoniensis and Fasti*.

Blister, a vesicle or bladder formed by the exudation of serous fluid between the epidermis and true skin, the result of a burn, friction as in rowing, disease, or the deliberate application of a remedial agent called a vesicant or B. Cantharides, or Spanish fly, is the chief remedy employed as a B., and is usually applied in the form of a plaster compounded of powdered cantharides, bees'-wax, resin, and lard, the mixture being spread upon adhesive plaster; the liquid and collodion of cantharides act more quickly, but are not so manageable. The vesicant causes a rapid local inflammation of the skin, swelling eventually occurs, and serum appears in from six to nine hours. The effect is to withdraw the blood from neighbouring parts and thus reduce inflammation, although if the B. be too near the affected part inflammation may be increased. It is also found that quite distant parts are affected, probably because the stimulus is conveyed by the peripheral nerves to centres from which it is radiated to other nerves. In this way the surgeons of former times empirically discovered that certain areas of the skin were sympathetically connected with certain organs of the body, though probably the benefit obtained by blistering was slight. For neuralgia, a B. may be placed over the spine, from which the painful nerves proceed, but not over the seat of pain. For some forms of headache, a B. on the nape of the neck supplies a counter-irritation. A B. over the heart in the early stages of acute rheumatism has a decidedly beneficial effect. A small B., whether produced artificially or not, is best left alone after being covered with greased lint, but if the quantity of serum is considerable, a small puncture will usually cause the gradual trickling away of the fluid. Bs. should in no case be applied to the very young or very old, or to persons suffering from acute kidney diseases.

Blister-beetle is the name applied to sev. species of coleopterous insects of the family Cantharidæ. They frequently possess an irritant which raises blisters if applied to the skin: use of this property has been made in medicine. The best known species is

Cantharis (or *Lytta*) *vesicatoria*, the Spanish fly, or common B., a native of Southern Europe, which occurs rarely in England. It is about three-quarters of an inch in length, and of a bright green colour; the legs and antennæ are bluish-black. It feeds on the leaves of trees and lays its eggs in a hole in the ground, where the *maggot-like larvæ live until* they pupate. *See* CANTHARIDES.

Blitum, now merged in *Chenopodium*, is a genus of plants belonging to the Chenopodiaceæ. Two species, *B. capitatum* and *B. virgatum*, are known as strawberry-blite, and grow in S. Europe.

Blitung, or **Blitong**, *see* BILLITON.

Blizard, Sir William (1743-1835), doctor, was born in Surrey. He was apprenticed to a surgeon at Mortlake, after which he studied at the London Hospital. In 1780 he became surgeon at the hospital, and helped to found a medical school there in 1785. He lectured at the school on physiology and anatomy. He became an F.R.S. in 1787, and president of the College of Surgeons. He wrote sev. pamphlets, including *Suggestions for the Improvement of Hospitals*. At one time he attended daily at a coffee-house in Cornhill for consultations.

Blizzard, a peculiarly fierce storm characterised by an icy biting wind and fine snow. They are often fatal to man and beast, especially in America. The suddenness of their commencement and the rapidity of the consequent fall of temp., together with the blinding snow, make them anticipated with dread by all who have once experienced them. Probably the most disastrous B. recorded is that of 1888 which was experienced in Dakota, Kansas, and Texas. So spontaneous was its attack that field labourers died on their way to shelter, quite as [illegible] caused by the memorable occasion severity of the cold the R. Colorado was frozen to a thickness of one foot. They are caused by the climatic conditions following the passage of cyclones across the Eastern American states. The term probably owes its origin to the usual noise occasioned by the violence of the wind.

Bloch, Jean de or **Bliech, Ivan Stanislavovich** (1836-1901), Russo-Polish financier, economist, railway contractor and writer. Son of humble Jewish parents, educated at Industrial High School of Warsaw. B. was administrator, under gov. appointment, of the whole railway system connecting the Black Sea and Baltic. He promoted an industrial movement in Poland, becoming head of the lumber and sugar trades; 1871-80 he wrote *Die Industrie in Zartum Polen*, 1875 B. pub. *Russian Railroads*, for which he was awarded a first-class medal at Paris Geographical Exhibition. He planned the establishment of a system of pension funds for pensioning railroad employees. With Vishnegradski he wrote a treatise on the subject; also in French, *Calculs servants des Bases pour des Caisses des Retraites*. He frequently engaged in scientific and philanthropic enterprises among the poor; 1877 B. pub. a series of essays on Russia's economic condition, intended to calm public apprehensions as to Russia's financial embarrassments; 1878 appeared his *Influence of Railways on the Economic Condition of Russia* (gold medal, Paris Exposition). Member of 'committee of scholars' of Ministry of Finances; 1882 pub. *Finances of Russia in 19th Century*. Other economic works were *Statistics of the Kingdom of Poland*, and various articles in the periodicals *Biblioteka Warzawska* and *Ateneum*. His *Les Ouvrages Statistico-Economiques*, 1875-1900, is an abstract of a much larger work dealing partly with Jewish fortunes in Europe. He vehemently defends their cause and denounces their abominable treatment and the trumped-up charges brought against them. B. is perhaps best known generally as a propagandist of universal peace. As such he became *famous by articles in Fr., Ger., and* Eng. periodicals, his war-and-peace museum at Lucerne, and *The War of the Future*, 1898 (Eng. translation, *Is War now Impossible?* 1899). This work was said to have inspired Nicholas II. to issue his 'peace' declaration, resulting in the Hague Conference, 1899. In it he tries to prove that under present conditions war must become practically impossible; for as, owing to various causes, modern wars must last long, they l result in starvation of both revolution and destruction of one state. His theories did not prevent the S. African and Russo-Japanese wars of recent years, but his scheme was to settle all *international conflicts by arbitration*. His pamphlet *Lord Roberts's Campaign and its Consequences* suggested the blockhouse scheme by which S. Africa was finally reduced. B. retired from business life before his death, devoting himself to science and literature. *See* Angell's *Great Illusion*, 1910; Vengerov, *Kritiko - Biograficheski Slovar*, vol. iii., 1892; Hans Delbrück in *P* [illegible] lov i

B. [illegible] (1834-90), Danish painter, *b* at Copenhagen. He studied at Copenhagen

Academy, went to Italy 1852-65, gaining a scholarship for Rome 1859. He first won a reputation for nature studies, especially those drawn from Jutland and Zealand, and for humorous pictures. His chief works are, however, historical. He won a first-class medal and the decoration of the Legion of Honour at the Universal Exhibition, 1878. In 1883 B. became professor in Copenhagen Academy, and professor at the school of Beaux-Arts. He excelled in portraying the semi-comic side of Italian convent-life, but sometimes treated sacred ceremonies too freely. B. painted two pictures for the Oratory of Fredericksborg, 'Visit of Mary to Elizabeth,' and 'Jesus Christ healing a Blind Man.' Other works are: 'Peasant's Cottage,' 1858; 'Fisherman's Family on Shore;' 'Repast;' 'Fisherman from Sorrento' (Copenhagen Gallery); 'Two Monks,' 1862: 'Roman Street Barber;' 'Prometheus;' 'Daughter of Jairus;' 'Samson and Delilah;' 'James of Scotland visiting Tycho Brahe;' 'Christian II. in Prison at Sonderburg,' 1871; 'Hans Tavson protecting Bishop Rönnow,' and two frescoes in Copenhagen University. *See* Müller, 33; Weilbach, 72; Muther, *History of Modern Painting*, 1895-6.

Bloch, Marcus Elieser (1730-99), ichthyologist, was by profession a physician. His invaluable *Allgemeine Naturgeschichte der Fische*, 1782-95, is the earliest standard work on ichthyology. Although he followed the arrangement of Linnæus, he estab. 19 new genera and 176 fresh species.

Blochmann, Henry Ferdinand (1838-78), orientalist, studied Eastern languages at Leipzig and Paris. Enlisting as a private in the British army in order to have opportunities of living in India to study the languages *in situ*, he early succeeded in obtaining his discharge through the kindly interest of Nassau Lees, who later secured him the assistant professorship of Arabic and Persian at the Calcutta Madrasa. With the exception of one or two archæological tours, B. passed most of his life at the Madrasa, where ultimately he became principal. The smallest details of Mohammedan Indian history interested him, and though his *Contributions to the History and Geography of Bengal* is invaluable, he will be longest remembered for his faithful translation of the *Ain-i-Akbari* of Abúl-Fazl (first vol. only), the appended notes of which give a splendid picture of the Emperor Akbar and his court.

Block, *see* Pulley.

Block, Maurice (1816-1901), a Fr. statistician. He was born on Feb. 18, of Jewish descent. He was naturalised at Paris after the completion of his studies at Bonn and Giessen. He entered the French ministry in 1846 in the agric. dept., and in 1852 he was appointed a member of the statistical office. His reputation as a statistician began upon his retirement in 1862 from public office, and a subsequent devotion of his whole attention to the compilation of statistics. In 1880 he was elected a member of Académie des Sciences, Morales, et Politiques, and on Jan. 9, 1901, he died. Among his works are: *Dictionnaire de l'administration française*, 1856; *Statistique de la France*, 1860; *Dictionnaire générale de la politique*, 1862; *L'Europe politique et sociale*, 1869; and *Annuaire de l'Economie politique et de statistique*.

Blockade, and Laws of. B., a term used in both military and maritime warfare, but restricted to a very great extent nowadays to maritime warfare. In military warfare it is an operation used in the place of a regular siege or bombardment, and consists of an attempt to cut off from all outside communications and supplies a hostile town. Obviously it is mostly used against a tn. difficult of bombardment and regular siege, but also in a number of cases against tns. with a thriving commerce and trade which find even a slight interference with that trade irksome, and are, therefore, the more easily inclined to surrender. In the military sense a B. consists of the actual possession by a military force of all means of entrance and exit from the tn. The examples of the B. of Paris and of Metz in the Franco-Prussian War of 1870-71 may be mentioned, although the former after being blockaded also underwent a terrific bombardment. Naval B., which is usually meant when reference is made to B., is, however, different in many essentials from military B. Originally naval B. must have been the equivalent of military B., that is, a port which was blockaded was as effectually cut off as a tn. surrounded by a military B., and even nowadays a naval B. is often only the naval supplement to a land siege, and in that case may be regarded as a purely military machine and an effectual barrier to all ingress and egress by sea. But quickly a differentiation must have grown up between naval and military B., since obviously it would be an open act of war for a neutral to attempt to cross the lines of a blockading army, whereas a neutral ship might attempt to enter a B. port with no knowledge that a B. was actually taking place and in the best

of faith. So in the course of time there grew up in naval warfare the recognition of the rights of neutrals, and notice was given to neutral powers of the state of B. But this in itself led to abuse: a power would notify a certain port as in a state of B. before the actual B. had taken place, and this ridiculous system reached its highest point in the huge paper B. of Napoleon's continental system and Great Britain's reply in the orders in council. The futility of the continental system, which forbade France or France's allies to have communication with Britain, was obvious in that Napoleon himself was dependent upon Britain for a great part of his supplies. America, as the neutral nation which really suffered most, protested strongly against this system. In the early part of the 19th century Great Britain and the U.S. asserted that in order that a B. should be binding

was declared that ' Bs. in order to be binding must be effective, that is to say, maintained by a force sufficient really to prevent access to the coast of an enemy.' Pacific B. has given rise to much protest from neutral nations, as, for example, in the B. of the Venezuelan ports by Great Britain, Germany, and Italy in 1902-3, so that it is now practically recognised that the right of B. is of a necessity a belligerent right. It is now recognised also that if a B. abandons its position save under stress of weather, if it is driven away by the enemy, or if it breaks the article, 'a B. must be applied impartially to the ships of all nations,' it ceases to be effective. The law as applied to the position of neutral vessels is, that neutral vessels are entitled to notification before they can be seized for violation of the B.; that this notification may be made by one of the blockading vessels, by proclamation or by notoriety. It is, however, usually recognised also that if a vessel shall have had notice in any way and attempts to violate the B., she is a good prize, but if such notice is not formal but arises from notoriety, then the rule shall be as leniently construed as possible. Amongst the subjects dealt with at the Hague Conference in 1908-9 was B., and a number of rules dealing with this subject were formulated.

Block-books. [illegible] printing from [illegible] blocks, is said to [illegible] in China five centuries before it was known in Europe. Early in the 15th century, many books, mostly religious, were printed in the Netherlands and in Germany by this process. As a rule, each page was mainly occupied by an illustration, with a few explanatory words appended, but sometimes whole pages of text were engraved. Hard wood was generally used, but before Gutenberg's time copper also had come into vogue. One of the best known series of B., the *Biblia Pauperum*, was taken from a book composed about 850 by St. Ausgarius, afterwards Bishop of Hamburg, and contained biblical pictures, with explanatory Latin text. About 1428 Lawrence Kostar, of Haarlem, printed an ed. of the *Speculum Humanæ Salvationis*, each page half picture, half text; the excellence of the latter (cut of course in reverse) is remarkable.

Blocking Course, a technical term applied in architecture to the course of stones or bricks placed above the cornice to make a termination.

Block Island, formerly Manisees, an is. situated about 9 m. S. of Rhodes Is., U.S.A. It belongs to the last-named isle, and has a length of about 8 m. At its northern extremity is a lighthouse. New Shoreham, a popular summer resort, stands on the is., whose harbour on the eastern side is improved, if not altogether formed, by a breakwater.

Block System, *see* RAILWAYS.

Bloemaart, Abraham, or Blom (*c.* 1565-1657), a painter of the Dutch school, born at Gorkum. He started his career while very young, painting all kinds of objects, but later on he settled down chiefly to the painting of landscapes, through which he became greatly esteemed. He is famous for his distinct originality, but more especially for the exceeding brilliance of his colouring. His greatest fame seems to have been attained in his representation of the chiaroscuro. In spite of all this, his paintings have been at various times very severely criticised. He had four sons: Cornelis, the youngest, was noted as an en[illegible] at Utrecht.

[illegible] N. Holland. It [illegible] Haarlem to the N., and has a pop. of 3554.

Bloemfontein, cap. of the Orange Free State. It is situated at a height of 4518 ft. above sea-level on the R. Modder. It is connected by rail with Kimberley, Cape Town, Port Elizabeth, and Johannesburg. Among its public buildings is the Raadzaal, formerly the meeting-place of the Orange Free State Raad, now the seat of the provincial council. Though its manufs. are few, its trade is very extensive. Its dry, healthy climate makes it a favourite resort of

invalids. Eng. is the common tongue. In 1904 the pop. was 33,883, nearly half of whom were white. Lord Roberts occupied the place during the Boer War of 1899-1902. It was chosen as the seat of the Supreme Court of S. Africa in 1910, upon the formal declaration of its recognition as a province of the Union of S. Africa.

Blois, the cap. of Loir-et-Cher, a dept. of France. It is situated mainly upon the r. b. of the Loire. The tn. is of two parts, ancient and modern. The former occupies a position upon a hill, while the latter is nearer the riv. The newer portion has fine quays, and is specially attractive to the visitor by reason of its magnificent old castle. Its many historical associations give it additional interest. Its pop. in 1906 was 18,457, and its manufs. are chiefly porcelain and gloves, and its trade in brandy, wine, and timber is increasing.

Blois, Peter of (*c.* 1120–*c.*1200), a mediæval theologian and moralist, born at Blois. He studied theology at Paris under John of Salisbury. Later on he became preceptor to William II. of Sicily, and was made Keeper of the Privy Seal in 1167. The next year he came to England as a private secretary to Henry II. In 1176 he became chancellor to Richard, Archbishop of Canterbury, and also to Baldwin, who succeeded Richard. His writings include many allegorising sermons and addresses.

Blok, Petrus Johannes, Dutch historian, born at Helder, 1855; studied at Leyden; professor of history at Groningen, 1884; at Leyden, 1894; directed historical studies of Queen Wilhelmina. His special study was social-political history of Netherlands in middle ages. Works: *Eene Hollandsche stad in de middeleeuwen*, 1883; *Geschiedenis van het Nederlandsche . . .* trans. as *History . . . Netherlands*, . . . of the monthl . . .

Blomefield, Francis (1705-52), a topographer, born at Fersfield, Norfolk, England. He is known principally by his great work, *The History of Norfolk*, which gives extensive information concerning his native county. He did not live to complete it, however, but died while at work upon the 3rd vol. It was continued later on by a Mr. C. Parkin, who pub. it in five vols. From 1805-10 it was again pub. in eleven volumes.

Blomefield, Leonard (1800 - 93), naturalist, formerly Leonard Jenyns, was educated at Eton and St. John's, Cambridge. In 1835 he pub. his excellent *Manual of British Vertebrate Animals*, the ornithological sections of which have been selected for special praise. From 1828-49 he was vicar of Swaffham Bulbeck, Cambridge, and, although the chair of zoology at his own university was offered him, refused to give up his parochial work. In 1860 he finally settled at Bath, to which town he presented the 'Jenyns' Library,' which contained 2000 vols. dealing mostly with natural history, and also his fine herbarium of British plants. He was the first president of the Bath Natural History Club, and was further a member of most of the learned scientific societies.

Blomefield, Sir Thomas (1744-22), general and colonel-commandant of the Royal Artillery, was with Admiral Hawke's fleet at Quiberon, served in the West Indies at the capture of Martinique and Havannah, and became in 1771 aide-de-camp to General Conway. As brigade-major he constructed floating batteries on the Canadian lakes: he was wounded at Saratoga. In 1779 he was appointed superintendent of the Royal Brass Foundry, in which capacity he carried out much needed reforms, substituting cast-iron and brass guns for the inferior ordnance he was obliged to condemn. In the expedition against Copenhagen in 1807 he distinguished himself by his command of the artillery, and from 1779 to his death made full use of his scientific experiments in gunnery in his work as inspector of artillery.

Blomfield, Sir Arthur William (1829-99), architect, was educated at Rugby and Trinity College, Cambridge. He had already built up a large practice for himself, when, in 1861, he was elected president of the Architectural Association. It was as architect to the Bank of England that he designed and built the law courts branch in Fleet Street. This is his most notable achievement, but he also designed and restored many churches and schools. The rebuilding of the nave and S. transept of St. Saviour's, Southwark, in revived Gothic style, and the entire S. porch, was carried out under his direct supervision, whilst his careful work may also be seen in Salisbury and Canterbury Cathedrals. Other of his productions are King's School, in Chester, the museum at Charterhouse, Godalming, the Royal College of Music, and the church of St. Barnabas, Oxford, the last in an Italian style.

Blomfield, Charles James (1786-1857), a bishop of London. His father was a schoolmaster at Bury St. Edmunds. From his father's school he proceeded to Trinity College, Cambridge. He became a fellow of the university. In 1810 he took holy

orders and became incumbent of St. Botolph, London, nine years later. In 1822 he was appointed archdeacon of Colchester. Subsequently he was ordained bishop of Chester in 1824, from which place, after holding office for four years, he was transferred to London. As a classical scholar he possesses some standing, and his editions of Æschylus. Callimachus, and Euripides are erudite and scholarly. His work as an ecclesiastic was, in an unusual measure, active and thorough. One of his objects was the building of additional churches. He personally superintended the organisation of a scheme to build fifty simultaneously.

Blommaert, Philip (1808–71), a Flemish author, born at Ghent. In collaboration with Conscience he worked to secure the revival of the Flemish language. His editions of *Theophilus* in 1836, a Flemish poem of the 14th century, and *Oud-vlaemsche Gedichten* in 1851 earned him a certain amount of literary fame as an anti-French zealot. A vol. of poems, his first product, are of less importance, while his greatest work is his history of the Belgians (1849). He demonstrates in this work the existence of a high standard of culture among his countrymen, attained in the face of political insignificance.

Blommer, Nils Johann Olsson (1816-53), Swedish landscape painter, born at Blommeröd in Sweden. He tried to represent all that lies in the poetry of the people, and portrayed mythical figures which belonged to no particular age or poet, but rather gave expression to national sentiment. Among his works are 'Neckan's Sport.' 'The Youth and the Elves,' 'The Faithful Sister.'

Blommers, Bernardus Johannes, Dutch painter, born at La Haye, 1845. He paints interiors, landscapes, and scenes of humble life. His pictures have great beauty of colouring and spiritual power, and depict largely the joy of life. In 1875 his 'Where are the pigeons?' won him much fame. Other works are 'Girl Knitting,' 'Shrimpers' (Amsterdam National Museum), 'Mother's Joy.' Private collections in London, Edinburgh, and Glasgow contain pictures of his. *See* Roose's *Dutch Painters of the Nineteenth Century*, 1898-1901.

Blond, or Blon, Jacques Christophe (1670-1741), a Ger. painter, born at Frankfort; studied in Italy, and lived for some years at Amsterdam as a painter of miniatures, and later of larger portraits. He then came to England and attempted to introduce Lostman's method of copper-plate reproductions in colour of mezzotints. He was not successful, and died miserably in a Fr. hospital.

Blondel, a Fr. minstrel, is famous in history because tradition says he was the means of securing the ransom of King Richard I. after his imprisonment by Leopold, on his journey home from Palestine. Unfortunately a late 13th century *Chronicle of Rheims* is the sole source of this tradition. According to the tale the harper in the course of his wanderings in search of his master, the Lion Heart, played one day a love song beneath the castle of Dürrenstein in Austria, and to his joy recognised the well-known voice of Richard singing from the tower the selfsame ditty.

Blondin, Charles (1824–97), a celebrated rope-walker. He was born at St. Omer, France. His professional career began at the age of five, when his talents earned for him the title of the 'little wonder.' Trained at Lyons, he devoted his abilities to rope-walking, and on his successful attempt to cross Niagara Falls on a rope 1100 ft. long and 160 ft. above the water, achieved instantaneous popularity. He performed the same feat many times, varying it with different accompaniments, among which were those of carrying a man across on his back, performing blindfold, wheeling a barrow, and on stilts. He died in 1897 at Ealing, London. Vast crowds flocked to his performances, the gathering at his first attempt over Niagara Falls numbering over 25,000.

Blood, the fluid by which the tissues and organs of the body are nourished and their waste products carried away. Arterial B., which is rich in oxygen, is bright red in colour; venous B., containing little oxygen, is dark red. It is slightly heavier than water (sp. gr. 1·06), has an alkaline reaction, and has a temp. of about 100° F. The quantity contained in the human body is about one-thirteenth of the whole by weight. It has a circulatory movement, being pumped through the arteries and veins by the heart at the rate of from 72 to 130 beats per minute, the amount propelled being from 150 to 190 c.cms. per beat. There are two circuits in the B. movement; from the left ventricle the fluid proceeds through the systemic circulation, communicating with all the tissues and organs except the respiratory system; it returns to the right auricle, is passed on to the right ventricle, whence at the next beat it is propelled through the pulmonary circulation, where it becomes oxygenated, returning again to the left auricle; it is once more forced to the left ventricle, where the cycle starts anew. Viewed

microscopically, the B. consists of a straw-coloured fluid containing a large number of small round red bodies called red corpuscles, and a smaller number of white corpuscles or leucocytes. The yellow fluid, called *plasma*, is very complex in composition, containing water, albumins, or proteids, and a certain amount of mineral salts, of which sodium chloride is the most important. One of the proteids, *fibrinogen*, is converted into a stringy substance, *fibrin*, when the B. leaves the body. The threads of fibrin settle down, carrying with them the red corpuscles, until the B. becomes a jelly-like clot. This process is called coagulation, and has important uses, for in a wound the B. clots as it emerges and plugs up the injured vessels. The calcium salts in the B. are essential for the conversion of fibrinogen into fibrin, so that clotting may be prevented by adding potassium oxalite, thus forming calcium oxalate, which settles at the bottom of the fluid, so that the surface does not coagulate. After the formation of the clot, a straw-coloured liquid separates out; this residue is called *serum*, and represents the plasma *minus* the fibrinogen. The plasma, therefore, serves as the medium for securing the mobility of the corpuscles, and also contains substances capable of producing coagulation.

Red corpuscles.—These are red biconcave discs of ·008 mm. diameter and ·002 mm. thickness. They have a tendency to run together in rouleaux when the B. is withdrawn from the body, and are so numerous that a cubic millimetre of B. contains about five millions. Hence it is that their scarlet colour dominates the B. as a whole; the red is due to the pigment *haemoglobin* which is enclosed in each corpuscle by a fine membrane. The *haemoglobin* is capable of combining loosely with oxygen, so that the *function* of the red corpuscles is to carry oxygen from the lungs to the different parts of the body. The tissues readily combines with substances which have a stronger affinity for it than haemoglobin, so that the oxyhaemoglobin travels back to the lungs deficient in oxygen and is darker in colour. The carbonates and other waste products are carried back dissolved in the plasma. The red corpuscles do not actually come into contact with the fibres of the tissues which they feed: the lymph or part of the colourless portion of the B. acts as an intermediary, passing through the walls of the capillaries and reaching every part of the tissues. The quantity of lymph in the body is greater than that of the B., and it has separate vessels called lymphatics which ultimately communicate with the thoracic duct, by which the lymph may be returned to the B. A pale colour in the blood results from poverty of red corpuscles, and is the condition called anæmia; the result is that the tissues and organs are not adequately nourished.

White corpuscles.—The leucocytes are animal cells consisting of protoplasm. They are capable of amœboid movement, that is, a corpuscle can change its shape and engulf small particles. This property renders them indispensable to the body as scavengers or destroyers of poisonous particles and germs. When disease germs are present in the B., there is a contest between their multiplying powers and the capacity of the leucocytes for absorbing them. They are found in the lymph as well as in the B., occur in varying forms, and probably vary in function. Leukæmia, or leukocythæmia, is a condition where the number of white corpuscles is higher than normal; an enlargement of the lymphatic glands occurs, and in the acute form other rapid changes take place which are highly dangerous.

Blood, Avenger of. Among primitive tribes, where there was no central authority to maintain order and justice, each community was bound to defend itself, and this induced in every family or clan a strong feeling of solidarity for purposes of protection or retaliation. If one member of it was injured all the rest were zealous for retribution. There seems to have been practically no distinction drawn in very early times between accidental and intentional homicide. Each was avenged alike, preferably by the nearest male relative of the slain man, 'the A. of B.' This state of things still exists in some countries, *e.g.* in Arabia, and even in the wilder dists. of Europe. Among the Hebrews, however, it was recognised that deliberate murder stood on a different footing from accidental manslaughter, and though the *Goel haddam* (from *Goel*, the nearest kinsman) in both cases sought for revenge, yet there were provisions made for securing to an unintentional homicide a place of refuge and a fair trial. For such the altar of the tabernacle and the cities of refuge were sanctuaries (Ex. xxi., Num. xxxv., Deut. xix.).

Blood, Thomas (*c.* 1628-80), an Eng. adventurer, was commonly styled Colonel B. He received presents of estates in Ireland in return for military services rendered to the parl. side. These were forfeited at the Restoration, but he again got possession of them from Charles II. He distinguished himself in 1663 by en-

deavouring to seize the lord-lieutenant of Ireland at Dublin Castle. At another time he attempted to seize the Duke of Ormonde with intent to hang him. Shortly after this, he almost succeeded in thieving the crown and jewels from the Tower of London. Charles II. visited him in prison, and through his fearlessness and persuasion B. obtained his release. One of his most daring adventures was the rescue of Captain Mason from a guard of troopers close to Doncaster.

Blood-bird, or *Meliphaga sanguinolenta*, is a species of the Australian family Meliphagidæ, or honey-eaters. The bird is small and beautifully coloured, with a long beak and tail.

Blood-flower, a plant of the Amaryllidaceæ family. It is indigenous to S. Africa. The usual colour of the flower gives it its name. It contains poison, and the juice of one variety, the *H. toxicarius*, is used in S. Africa for the poisoning of arrows. The flower is in the form of a fine cluster. Propagation of bulbs is sometimes achieved by cutting bulb across, an operation which causes secondary bulbs to grow on the edge.

Bloodhound, belonging to that class of dogs called hounds. Its name is derived from its finely
sense of smell, and more
where this sense is employ
tracking of a bleeding creat
blood provides the scent necessary. The dog is able to select from a constantly moving herd of deer the wounded one, and to track it through seemingly impassable difficulties. It is sometimes alluded to as a sleuth-hound, from the Middle-Eng. word 'sleuth,' meaning track. It is probable that from the B. all other varieties of the hound breed are descended. Formerly it was greatly used in Britain, though its use is now very rare, the latest occasion when Bs. were led being about 1880, when Lord Wolverton hunted with them in Dorsetshire. The physique of a B. is magnificent, and especially noble is the build of the head. The large dropping ears, the long face, and the pose itself, give it a dignified and grave bearing. The colour of the animal is deep tan, occasionally with black spots. Their use in sport and in the sterner purposes of man-hunting dates from the Romans. Until the abolition of the slave trade in America, their use in tracking runaway slaves was almost universal, though the variety of hound then used was not the pure B., but a type called the Cuban-hound. This type is largely different from the true, and resembles a breed obtained by crossing mastiffs with bull-dogs, but their inferiority in qualities of perceptive scent was amply balanced by their extraordinary ferocity. It is sometimes called the Cuban-mastiff. The method of the B. in retaining the scent of its quarry is to follow it steadily and slowly till it is successful in reaching the object pursued. If, however, the scent is lost, the sagacious animal carefully retreats along the unsuccessful path till the scent is found, when it makes a fresh attempt in another direction. The characteristics of the B. are as follow: The head is long and dome-shaped, with large pendulent ears; between the eyes and above them are puckers of the skin, which add to the dog's already intelligent expression; the eyes themselves are somewhat
third lid is
bloodshot
breeds no
European
in through
art of the
various nobles to secure a perfect strain, to attain which end the greatest expense and pains would be incurred.

Blood-poisoning, a morbid condition due to the circulation of bacteria in the blood stream. *See* PYÆMIA.

. a red rain which falls in
Europe. Microscopic
reveals red dust from the sandy deserts of N. Africa to be the cause of the phenomenon. The cause is thought to be found in the upward force of waterspouts and whirlwinds. Among the natives of N. Africa these rainless whirlwinds are called 'devils.' The Canary Islands are subject to similar phenomena.

Bloodroot, or *Sanguinaria canadensis*, is a species of Papaveraceæ native to N. America. It grows from a rhizome which is of use medicinally.

Blood-stains, the dried and darkened residue left on clothing, etc., after contact with blood, often important as evidence in criminal actions. The problem may be to decide whether a given stain was produced by blood or not, whether the blood was that of a human being or not, or whether the stain is recent or not. The time for which a B. has been in existence can only be approximately decided by the amount of hardening or the deepening of the tint. After the blood has become black, no further change can be detected. The tests to decide whether a stain was produced by blood or not may be microscopic, spectroscopic, or chemical. The stained substance is first soaked in a solution of glycerine in water to a sp. gr. of 1·028. This

softens the stains without causing other changes. Examination under the microscope should then reveal the presence of corpuscles, which, however, are similar in shape amongst all the mammalia except the camel tribe. For spectroscopic examination a solution of the suspected substance in water is prepared. The spectrum of blood exhibits two dark bands, one in the middle of the green rays, and the other between them and the yellow. The addition of ammonium sulphide to the solution reduces the oxy-hæmoglobin to hæmoglobin, and one dark band only is exhibited. The chief chemical tests are the reaction with guaiacum and the production of hæmin crystals. The former is carried out by treating the stain with tincture of guaiacum, and adding a small quantity of peroxide of hydrogen. A bright blue colour is produced, but the test is not decisive. Hæmin crystals are produced by adding common salt and glacial acetic acid to the stain and heating to evaporation. These tests merely decide the presence of mammalian blood, and to distinguish between human and other blood it is necessary to make use of the effect of inoculating animals with the blood of a different species. If, for instance, a rabbit has been inoculated with human blood, its blood produces an antiserum which reacts in a certain way with a solution of human blood, from whatever individual it may have come, and which does not react in that way with the blood of an individual of any other species. It is only necessary, therefore, to treat the blood of a suitably inoculated rabbit with a solution of the suspected stain, to decide whether the latter was produced by the blood of man or not.

Bloodstone, a name given to the stone heliotrope. It is a dark green with red spots. The presence of a chloritic mineral explains the green colour, while the red is due to hæmatite. Inferior types are characterised by an opaqueness, and bear a resemblance in this respect to the jasper. A distinction is drawn between the B. and the heliotrope from this same transparent property, present in the heliotrope and absent in the common forms of the B.; but the distinction is scientifically untrue, and therefore unrecognised. In the Deccan traps of India the B. is found in large quantities, and it is cut and polished at Cambay. Its use is mainly in the decoration of seals, knife-handles, etc. The name is applied also to hæmatite.

Blood-worm is the popular name applied to the larvæ of some dipterous insects of the genus *Chironomus* and family Chironomidæ. In form they are worm-like, and owing to the hæmoglobin present in it their blood is red; they live in mud and sand in water, and anglers use them for bait. The full-grown insect is a midge with narrow wings and long, plume-like antennæ. *C. plumosus* is a common British species.

Bloomer Costume. About 1848 the 'Woman's Rights Movement' in America gave rise to the adoption of an attire for its members somewhat resembling that of man. In the following year, 1849, Mrs. Bloomer gave her name to a costume which consisted of a short jacket, a short skirt reaching just below the knee, and a pair of 'bloomers' obviously made from the pattern of Turkish trousers. The courage necessary to adopt the new form of apparel was found wanting in many, and the social effects prevented all save a few from following Mrs. Bloomer's advice. Many ideas relative to the improvement of feminine attire have been advanced, of which the 'divided skirt' is the nearest approach to the bloomer costume.

Bloomery, a refining furnace for changing pig iron into malleable iron. The iron is melted by the furnace, and a blast driven through pipes oxidises the carbon and silicon, a 'bloom,' or lump, of malleable iron being the result.

Bloomfield, cap. of Davis co., Iowa, U.S.A. It is situated 1 m. S. of R. Fox. It possesses flour mills, and contains the S. Iowa Normal and Scientific Institute. Its pop. is 1913.

Bloomfield, Benjamin, Baron (1768-1846), lieutenant-general, owed his advancement to his musical talents, which favourably impressed the Prince of Wales, afterwards George IV. The latter appointed him his chief equerry in 1806, and eleven years later the keeper of the privy purse. Until 1822 B. remained the Prince's confidential adviser, and although he then resigned his appointments because he had fallen into disfavour, he was sent to Stockholm in 1824 as minister plenipotentiary. His benevolence was conspicuous during his direction of the garrison of Woolwich, where he founded schools for the children of soldiers of the ordnance corps.

Bloomfield, Robert (1766-1823), an Eng. poet, was born at Honington and educated at the national school. He learned the shoemaking trade in London. His first poem, *The Milkmaid*, was pub. in the *London Magazine*. In 1786, while staying in the country, his idea originated for the *Farmer's Boy*, and he afterwards composed it in a London garret. It

was pub. in 1800, and 25,000 copies were sold. His later life was rendered unhappy through blindness and poverty.

Bloomington: 1. A city of McLean co., Illinois, U.S.A. It has foundries and machine shops, meat-packing establishments, and timber-yards. Valuable coal mines are near the city, which is situated in a fertile and progressive farming region. A small forest called Blooming Grove gives the tn. its name. Its commercial rise dates from 1867 when the proximity of coal was discovered. Pop. (1906) 25,506. 2. A city of Monroe co., Indiana, U.S.A. Its pop. of 6460 are employed chiefly in the manuf. of furniture and wooden articles, and in the adjacent limestone quarries. It has a noted university, whose station of biology is situated at Winona Lake, Kosciusko co. Its settlement took place in 1818.

Bloomsbury, a dist. of W.-Central London, lying N.E. and S.W. between Gray's Inn Road and Tottenham Court Road, and N.W. and S.E. between Euston Road and Holborn. It contains the British Museum, University College, University College Hospital, and other public buildings.

Blore, Edward (1787-1879), architect, born at Derby on Sept. 13, son of the topographer, Thomas B. (1764-1818). He designed a house at Abbotsford for Sir Walter Scott, and executed designs for other important mansions and public buildings in various parts of the country. He was entrusted with work at Lambeth Palace, Windsor Castle, Glasgow Cathedral, etc. He did much to revive the Gothic style of architecture. He d. in London.

Blore with Swinscoe, a township of N. Staffordshire. It is situated 4 m. N.W. of Ashbourne. Pop. 250.

Blount, Charles 1654-93), English author, born at Upper Holloway on April 27. His father, who was Sir Henry B., had pub. a description of his journey to the Levant. Every paternal care was lavished upon Charles' education. His *Anima Mundi* awoke considerable criticism on account of its scepticism, and was banned by the Bishop of London. His best known book is *The Two First Books of Philostratus, concerning the Life of Apollonius Tyaneus*, 1680. His end was tragic. An infatuation for his deceased wife's sister was made hopeless b
and B. sh
Blount, T
quarian, b
shire. Detailed knowledge of his life is scanty. His Catholicism hampered his career at law, and he retired to his state at Orleton. He continued his study of the law, but with no professional intentions. His works are *Glossographia*, a work still of value among literary antiquarians; *Nomolexicon*, a dictionary of law terms; and *Fragmenta Antiquitatis*. His *Boscobel* appeared, ed. with his Life, in 1894. He died at Orleton.

Blouse was originally the Fr. term used for a loose-fitting upper garment worn by the peasants, the favourite colour being blue. The B. has for very many years been popular with women of all countries, and specially of England and America.

Blow, John (1648-1708), was an Eng. composer of music. He obtained his degree of doctor of music, and then became organist of Westminster Abbey in succession to Purcell. In 1674 he was master and composer at the *Chapel Royal*, and afterwards master at St. Paul's Cathedral. He composed the music for the anthem 'I was glad when they said unto me' at the opening of the cathedral.

Blow-fly, or **Blue-bottle**, is the name given to sev. species of Muscidæ, dipterous insects related to the house-fly, *Musca domestica*. They differ from the ordinary fly in being of greater size, having a bright blue abdomen, and in flying with a loud buzzing sound. The eggs are deposited in meat and develop into maggots. *Calliphora vomitaria* and *C. erythrocephala* are common British species; and *Sarcophaga carnaria*, the flesh-fly, a member of the family Sarcophagidæ, resembles the B. very closely.

Blowing-machine, a contrivance
re or less con-
compressed air.
pe is the ordin-
which consists
of a wedge-shaped chamber with collapsible leather sides; the top and bottom are rigid, and the bottom is provided with a valve opening inwardly, so that as the collapsible sides are extended, the air enters. When the top and bottom are squeezed together again, the air is prevented by the valve from escaping otherwise than by the nozzle. In the double bellows there are two compartments separated by a fixed partition, and an inwardly opening valve is situated in the under side of each compartment. On the machine being extended and compressed by a lever acting on the lowermost rigid board, the air enters the lower compartment, whence it can only escape to the upper one, which acts as a reservoir, a weight on the uppermost rigid board producing a fairly continuous current through the outgoing pipe from the upper compartment. For blast-furnaces blowing-engines, depending upon the to-and-fro motion of a steam-driven piston, are used. There is a chamber

with an inwardly-opening valve on each side of the piston, so that air is expelled at each stroke. Both chambers of the cylinder communicate with a large air-reservoir, so that the blast is kept uniform. Fans for compressing air depend upon the centrifugal motion of air between vanes fitted to the spokes of a rimless wheel. The fan is enclosed in a cylindrical chamber somewhat excentrically; the air is admitted at orifices around the axle, is driven towards the circumference by the revolution of the fan, and emerges through a pipe fixed tangentially. The best results are obtained with curved vanes, the convex side towards the exit. In parts of Spain a water B. is used. A fall of water is necessary, and the arrangement includes a cistern where the water collects; a wooden shaft with a few air holes through which air is sucked as the water falls down the shaft; and a wind chest where the air and water separate. The water flows away through an exit pipe at the bottom of the chest, and the air is forced out through a nozzle by the compression induced by the continuous descent of air mixed with the falling water. Roots's rotary blower has a chamber which consists of two semi-cylinders separated by a rectangular space greater in width than the radius of the cylinders. Mounted axially with the cylinders are two revolving pieces, shaped like a figure-of-eight, almost equal in length to the diameter of the semi-cylinders. They revolve in opposite directions, being at right angles every quarter-revolution. The air enters at the base of the chamber into the space between the revolving pieces which gradually diminishes until the air is expelled at the top of the chamber.

Blowpipe is a weapon employed by Indian tribes of S. America both in hunting and in war. A poisoned shaft, fixed in the end of the B. or tube, is driven out by the breath. The tube, usually about 10 ft. long, is made of reed or the stems of a palm. Near Para, the poisoned arrows, made of palm spines, are 17 in. long, whilst in Peru they are only about 2 in. in length. In Borneo, the Dyaks have a similar weapon called a 'sumitan.' The arrows are there tipped with the upas-juice. One great advantage of the B. is that it makes no noise, so that the hunter can discharge a quiver-full before picking up his game. The arrows are deadly, even at a distance of 35 yards.

Blowpipe, an instrument used with a gas or spirit flame to quicken combustion and therefore increase the temperature of the flame area. In its usual form it is a conical vessel with the mouthpiece at the narrow end and a fine nozzle inserted towards the base. This shape provides an air chamber which tends to equalise the blast, and in which the moisture of the breath may condense. A uniform blast can, however, only be obtained by using the mouth as an air-chamber, keeping it well distended by air throughout the operation. Glass-blowers use a similar instrument, and for high temperatures a blowing-machine is used.

Bloxam, John Rouse (1807-91), historian, educated at Rugby and Cambridge; M.A. of Magdalen College in 1835, D.D. 1847, a fellow 1836. In 1841 he became pro-proctor of the university, and held various offices at his college until 1862. He was full of sympathy with the Tractarian vicar of Upper Beeding, Sussex. He published and left in manuscript valuable collections relating to the history of Magdalen College.

Bloxwich, a vil. of E. Staffordshire. It is an eccles. dist., and is situated 3 m. N. of Walsall. Its pop. is 5558.

Blucher, Gebhard Leberecht von (1742-1819), Prussian field-marshal, Prince of Wahlstadt, was born in Mecklenburg-Schwerin. In the year 1756 he entered the service of Sweden, and four years later was captured by Prussians in the Pomeranian campaign. He was persuaded by his captors to enter the service of Prussia and was given a lieutenancy. He served in the later battles of the Seven Years' War. He gained promotion to the rank of captain, but by his excesses in private life lost favour with the authorities, and disgusted with his treatment retired into private life (1773). 'Captain B. can now take himself to the devil,' was Frederick's comforting remark on his resignation. For fifteen years he settled down on his own property and devoted himself to farming, but in 1788 after the death of Frederick he was restored to his old regiment the Red Hussars, in the following year he became a colonel, and in 1794, as a reward for his services in the Fr. campaigns, he was made a major-general. In 1801 he became a lieutenant-general. The war of 1805-6 found him active as a cavalry leader, and as such he took part in the battle of Auerstadt, and he covered the rear of Prince Hohenlohe's army on the retreat to Pomerania. He then went northward and fought in the neighbourhood of Lubeck, being in Nov. 1806 forced to surrender to the Fr. at Ratkau. He was soon exchanged and was actively employed in various parts of the country until the Treaty of Tilsit. During the period of Napoleonic domination he was

actively in touch with the national party, and was, in 1812, banished for his pronounced opinions from the court. The beginning of the War of Liberation found him placed in high command of the Prussians, and he organised the Prussian army, becoming commander-in-chief of the army of Silesia with 90,000 men under his command. He was full of energy and was prepared to attempt anything. His army was kept together to a very great extent owing to the knowledge that B. would attempt anything whether supported or unsupported. He defeated Macdonald at Katzbach, and by his defeat of Marmont prepared the way for the defeat of Napoleon at Leipzig. He was made a general field-marshal after the defeat of Marmont, and stormed Leipzig on the last day of the battle. He persuaded the allies to carry the war into Fr. ter., and by his courage and energy in the face of defeat he ultimately triumphed and led the army of Silesia directly on to Paris. He proposed that the ravages of the French in Germany should be avenged by equal ravages in Paris, but was prevented from carrying out his proposals. In 1814 he visited England and was welcomed everywhere enthusiastically; in the same year also he was made Prince of Wahlstadt. He retired to Silesia, but was soon called from his retirement to take part in the campaign of the Hundred Days. He sustained a severe defeat at Ligny, and in this battle nearly lost his life. But he moved on and marched to the assistance of Wellington. His forced march was the means of his intervening at the critical moment in the battle of Waterloo, and of turning the defeat of the Fr. into a headlong rout. The rout was complete and decisive owing to B.'s relentless pursuit of the enemy. The allies re-entered Paris in July 1815, and here B. stayed for some time. He retired, however, to his Silesian estates owing to his age, and died there in Sept. 1819. Throughout his life he was rash, hasty, and impetuous, but these qualities, which told against him in private life, were the means of making him a dashing leader of cavalry, a good patriot, and a great general.

Bludenz, a tn. of Austria. It occupies a position on the R. Ille. It has an interesting castle and alum works. Its pop. is 2466.

Blue, one of the primary colours. Artists use as B. pigments: ultramarine, which is prepared from lapis lazuli and is very expensive; cobalt B., of which there are many varieties, consisting of cobalt mixed with earthy or metallic bases; indigo; Prussian B., which is ferrocyanide of iron. In dyeing, the Bs. form a large group of the coal-tar products. In laundry-work a B. colour is imparted to linen and cotton goods in a very faint degree to heighten the impression of whiteness; many preparations for this purpose are in use.

Bluebeard, a character first appearing in 'Barbe Bleue,' one of Perrault's *Contes* (1697). He was a monster of wickedness who killed his wives, hiding their bodies in a secret room. His end came through an unconquerable curiosity of his last wife, who opened the secret room and made the gruesome discovery. He was killed by her brothers. His blue beard gave rise to the appellation.

Bluebell is the name given to the *Campanula rotundifolia* in Scotland, where it grows very abundantly, and which is a species of the monocotyledonous order Liliaceæ.

Blue-bird, sometimes called Blue-warbler and Blue-robin. It is a native of America, and is recognised with as much pleasure as the robin is by the English, by reason of its tameness and absence of fear of human beings. It is rather larger than the robin, though its general appearance and diet closely approach it. It lays about six pale-blue eggs. As a migratory bird it sounds the approach of spring with its return.

Blue Bird is the name of a play, written by Maurice Maeterlinck, which first appeared in London in 1910, and was regarded as a very great success. It is an allegorical fairy tale, and recounts in an extremely simple, charming manner the adventures of a boy and girl in search of happiness (the 'Blue Bird').

Blue-books, a name given to parl publications, which are usually bound with blue covers. The idea of printing records of parl. business originated in a dispute in 1681 over the question of the Duke of York's exclusion from the throne. A statement was circulated that falsified accounts of the proceedings had been circulated, and it was therefore proposed by Sir John Hotham to print all reports. The cheap price of these publications has only been in vogue since 1836. Save where a special price is stipulated, the usual amount charged is one halfpenny per sheet of four pages. A subscriber of £20 annually may obtain all parl. records issued throughout the year. Naturally the output increased in bulk, and possibilities of confusion in their arrangement

existed, but the method of indexing adopted and the inclusion of a précis in the front of each vol. makes it possible to refer quite quickly and easily to any paper, no matter how trifling, or of what session. From the Board of Trade a useful publication is issued monthly for sixpence, which contains valuable information relating to the world's trade and commerce. Without counting the accounts of the different Bills, the number of B. issued in 1887 was 1234. In 1887 a resolution was passed concerning the reproduction of printed matter in the B., which stated that no restraint would be exercised upon the reproduction of information contained in the majority of gov. publications, but that every rule of copyright was to be observed in the treatment of matter printed in the *Board of Trade Journal*, the reports of the *Challenger*, and official maps and charts. The distinctive colours which mark foreign 'B.' are, America, foreign correspondence, red; Ger., white; Fr., yellow; Austrian, red; Portuguese, white; It., green; Japanese, grey; and Chinese, yellow.

Blue-bottle, Cornflower, or *Centaurea Cyanus*, is a species of Compositæ well known in our corn and wheat fields. The pretty blue head has large neuter florets of the ray.

Bluebottle-fly, an insect related to the house-fly. It is larger than the latter, but smaller than the blow-fly. A loud buzz marks its flight, and the extent of its wings across is almost an inch. Its head is black, the thorax grey, and the abdomen blue, with three black stripes. Its finely developed sense of smell enables it to find the flesh upon which it lays its eggs. It thrives most numerously from spring to autumn, and is common to Great Britain and Europe. There are many species, the most common among them being the greenbottle-fly. The process of development from the egg occupies about one month

Blue-breast, or *Motacilla succica*, is a bird belonging to the wagtail family. It breeds in holes of trees, lays greenish-blue eggs, feeds on insects and worms, and has a sweet voice. The plumage of this little creature varies from ashy brown above to bright blue beneath, and it is noted for its sweet song.

Blue-coat School was founded soon after the endowment of Christ's Hospital by Edward VI. The old school buildings in Christ's at Newgate Street were given up in 1902. The fine new school at Horsham, Surrey, is now conducted on ordinary public school lines. The uniform still consists of blue gown, yellow stockings, and knee breeches. *See also* CHRIST'S HOSPITAL.

Blue-eye, a bird of minute structure and great beauty. It is found in large numbers in New S. Wales. It belongs to the honey-eaters, and goes under the name of blue-checked honey-eater. These birds often congregate upon thickly-flowered branches and suspend themselves in every conceivable position. They are scientifically called *Entomyza cyanotis*.

Bluefields River, a river of Nicaragua flowing into the Pacific Ocean. It is joined by the Escondida, and empties itself into Bluefield's Bluff. The tn. of Bluefields is within a few miles of its mouth. The river is about 50 m. in length.

Blue-fish, a fish belonging to the family Scomberidæ. It is characterised by the absence of detached finlets, isolated dorsal spines, and lateral armature of the tail. It has two dorsal fins. The E. coast of N. America is its only home. It is blue on top and whitish below, while a large black spot is seen at the base of the pectoral fins. Its food is other fish of smaller size; and it attains a length of three to five feet.

Blue-gowns, a term given to Scottish paupers. It originated from beadsmen who in return for a small annuity were employed by persons desirous of their efforts in prayer. On the king's birthday each beadsman received a blue cloak, a loaf of bread, a bottle of ale, and a penny for every year the king had lived. Attached to the gown was a medal which bore the message 'Pass and Repass,' which practically authorised their mendicancy. The practice was stopped 1863, and the calling has become extinct.

Blue-grass, a grass found in Europe and N. America. It is permanent, and has a great value as pasturage. The property of its creeping root-stalks causes it to form thick turf. It is noted in Kentucky. Another name is June grass.

Blue Island, a vil. of Cook co, Illinois, U.S.A. It has copper works and extensive brick yards. Pop. 3000.

Blue Jay, or *Cyanocitta*, is an American genus of the Corvidæ, or crow family. *C. cristata* is a beautiful bird, the plumage being blue above, white beneath, and variegated with black and white Like other members of its family it is a great thief, and in the spring it eats both the eggs and young of other birds, though in the summer it feeds on fruit and insects. It has a harsh and unmelodious voice.

Blue John Mine, a cave of many chambers in Derbyshire. It is situated in Tray Cliff in the N. of the co. W. Castleton is 1½ m. distant.

Blue Mountains: 1. A spur of the

Dividing Range of mts. in New South Wales. They run almost parallel with the coast about 80 m. from it. A passage was found over them leading to the Bathurst Plains in 1813. Mt. Beemarang, 4100 ft., is the highest point. Parts of the roads which cross them are 3400 ft. above sea-level. Great engineering obstacles in the construction of a railway over them have been overcome. Caves exist of great size, those of Jenolan being notable. 2. A range of mts. in Oregon, U.S.A. It extends from N. to S. passing through the co. of Umatilla. The mts. are composed chiefly of granite, and their slopes are covered with great forests of pine and fir. 3. A range of mts. in Jamaica, whose highest peak is West Peak, 7105 ft. The alt. of this system, whose main chain extends from E. to W. varies between five and seven thousand feet. 4. (Kittatinny) A long mt. system of Pennsylvania and New Jersey, forming part of the Appalachian system. It stretches from Orange co., New York, traversing the counties of Sussex and Warren in New Jersey. At the Delaware Water Gap the R. Delaware crosses the mts. Their structure is largely of rocks belonging to the Silurian period.

Blue Pill, a mercury preparation of considerable therapeutic value. It may be prepared by rubbing 2 oz. of mercury with 3 oz. of confection of roses and adding 1 oz. of powdered liquorice. Mercury in this form is active, and produces marked effects; the blood corpuscles are increased in number, the blood is improved temporarily, and sources of irritation in the intestines are quickly removed. It is therefore useful in what is usually called biliousness, but its continued administration is generally not advisable.

Blue Ribbon is the badge of all total abstainers, who at one time styled themselves the 'B. R. Army.' The army commenced its career in 1878 in America, and extended to Britain. The term probably originated from the B. R. badge which was worn by each Knight of the Garter. The term is used also when speaking of some prize, as, for instance, the 'Derby' stakes.

Blue Ridge, the easternmost chain of the Appalachian Mts. of Virginia and Carolina. It is famous for the splendour of its scenery. Its highest point is the Grandfather, in N. Carolina, 5897 feet.

Blue Shark (*Carcharias glaucus*), a native of tropical seas, but a frequent visitor in warm summers to the English Channel, where it is detested by the fishermen, as it destroys both fish and nets. It is generally 6-12 ft. long.

Blue-stocking, a term applied to ladies of learning and literary accomplishments; especially those who air their erudition in a manner pedantic and unwomanly. About 1750 a literary circle was estab. in London consisting of ladies and gentlemen, among whom was the distinguished Mr. Benjamin Stillingfleet, who wore regularly blue stockings—hence the name. The name has been adopted in France and Germany.

Blue Suns. In Aug. 1883 a series of tremendous volcanic explosions occurred in the Sunda Straits; the Krakatoa Mt. was completely blown away, leaving a cavity of 1000 ft. deep, and the contour of the straits was changed for many miles. The darkness caused by clouds of smoke, ashes, and mud was so great that at Batavia, 100 m. distant, lamps were lit at mid-day. It was estimated that dust, stones, and mud were projected to a height of 17 m. But far above these the finer particles and sulphurous gases were carried westward by atmospheric currents, spreading also N. and S., and reaching in a few weeks all round the world. Unnoticeable during the day, they produced a wonderful effect at sunset, the sun itself appearing of various strange colours, blue, green, coppery, etc. This curious phenomenon was remarked everywhere within 30 to 40 degrees from the equator.

Blue-throat, sometimes called Blue-breast, is a bird closely resembling the nightingale, and possesses beauty of form and voice. Its ability to imitate the songs of other birds earned for it a Lapland name meaning a hundred tongues. The throat and upper neck are bright blue. The females are less conspicuous than the males. As a bird of passage it is known in many parts of Europe.

Blue-wing, or *Querquedula discors*, is a species of Anatidæ, and is often called the blue-winged teal. It is a brilliantly coloured bird with bright blue wing-coverts. It is a native of N. America which migrates in winter to S. America.

Blum, Hans, a Ger. author and [illegible] 1841. Edu- Leipzig and [illegible] Reichstag, [illegible] barrister at Lei [illegible] Daheim in [illegible]-9 ed. *Gr.* [illegible] of his father; *Die Lügen unsrer Sozialdemokratie; Fürst Bismarck und seine Zeit; Das erste Vierteljahrhundert des deutschen Reichs*, 1896; *Die deutsche Revolution*, 1848-9; *Aus dem tollen Jahr; Eigene Lebenserinnerungen*, 1907. B. also wrote drama and fiction, including *Die Ueberbande.*

Blum, Robert (1807-48), a Ger. politician, born at Cologne of poor parents. He was at first engaged in manual labour as an artisan, but though self-educated he later (1831) became secretary and cashier to the Leipzig theatre. Here his literary career began, and in 1840 he became prominent as the founder of the *Schillerverein*. In 1845 he was a leader in the German Catholic movement, and during the stormy scenes which took place during the revolution he did much to control the mob. He was elected member of the Frankfort National Assembly, where he was the chief leader of the Left. In 1848 he was sent to Vienna, as bearer of a congratulatory address from the Left to the people of that city on their revolution. He himself took arms in it; was arrested and shot, Nov. 9.

Blumenau, a Ger. colony in Santa Catherina, Brazil; on R. Itajahy, 60 m. N.W. of Disterro. Founded in 1852. Healthy and fertile. Pop. 30,000. The cap., B., is the seat of a Ger. consul. Pop. 5000.

Blumenbach, Johann Friedrich (1752-1840), Ger. naturalist, born at Gotha; educated at Jena and at Göttingen, where he became extraordinary professor in 1776 and ordinary professor in 1778, remaining at the university for about sixty years. During that time he lectured on natural history, anatomy, medicine, and physiology, and made researches of the greatest value. In 1785, and therefore before Cuvier, he estab. the dependence of zoology on comparative anatomy, and also made important contributions to ethnology. He visited England in 1788 and 1792, and his jubilee in 1825 was made an international celebration. He resigned his professorships in 1835. His works include: *De Generis Humani Varietate Nativa*, 1775; *Manual of Natural History*, 1780; *Institutiones Physiologicæ*, 1787; *Collectio Craniorum Diversorum Gentium*, 1790-1828; *Manual of Comparative Anatomy and Physiology*, 1804, etc., many of which were trans. into sev. languages. He was very popular both as an author and a lecturer.

Blumenbachia is a S. American genus of Loasaceæ with a hairy fruit which becomes attached to the coats of wild animals and thus distributes the seed.

Blumenthal, Jacob von (Jacques), Ger. pianist, born at Hamburg, 1829. After studying under Grund (Hamburg), Bochlet and Sechter (Vienna), and Herz and Halévy (Paris), he came to London in 1848. Here he was appointed pianist to Queen Victoria, and soon became well known as a composer and teacher of music. He wrote many popular songs, of which the best known is, perhaps, 'My Queen.'

Blumenthal, Leonhard, Count von (1810-1900), Prussian general, received military education in Prussian Cadet Corps (becoming officer in Reserve Guard, 1827), and at Berlin Military Academy. Member of the general staff, and chief of the staff, of Schleswig-Holstein army, 1849. He served in the campaign against Denmark, 1864, and under Crown Prince Frederick William in Austrian Campaign in the same capacity. B. was chief of the staff to Crown Prince of Prussia in Franco-Prussian War (1870-1), being present at the surrender of Sedan and the siege of Paris. Later he commanded Fourth Army Corps, with head-quarters at Magdeburg, becoming general of infantry, 1873. In 1888 created field-marshal by Emperor Frederick III.; inspector-general of Fourth Division.

Blumenthal, Oskar, Ger. dramatist and satirist, born in Berlin, 1852. Founder and manager of Lessing Theatre there (1888-97). Among his light, popular comedies are: *Der Probepfeil; Die grosse Glocke; Der schwarze Schleier*, 1891; *Heute und Gestern* and *Im weissen Rössel* (both with Kadelburg as were sev. others); the serious dramas, *Der tote Löwe* and *Der Schwur der Treue*, appeared 1904-5. B. also wrote sketches, epigrams, and satires, including *Allerhand Ungezogenheiten; Gemischte Gesellschaft*, 1877; *Aus heiterm Himmel*, 1882.

Blunderbuss (perverted form from Dutch *donder*, thunder, and *bus*, gun, original, box), a short gun with a large bore, firing a number of balls or slugs. Its name may have been perverted to 'blunder' because practically no aim is taken with it. At short range it can do much damage among a number of objects. It is now obsolete.

Blundeville, Randolph de, Earl of Chester (*d.* 1232), a warrior and statesman, succeeded as Earl of Chester in 1180. He married Constance, widow of Geoffrey, son of Henry II., in 1187. He joined in Richard's interest in the siege of Nottingham in 1194, accompanied Richard to Normandy, quarrelled with Constance, and imprisoned her in the castle of St. John Beveron in 1196. A few years afterwards he married Clemence, sister of Geoffrey, accompanied John abroad in 1199. He led armies engaged in Welsh wars and accompanied John to Poitou in 1214. He took John's, and later Henry III.'s side against the barons in 1215, and together with Fulk de Bréauté, stormed and plundered Worcester in 1216. In 1217 he received the earldom of Lincoln, and the following year he

went to the Holy Land. Here he joined in the siege of Damietta in 1219. Returning home he deserted the royal party and plotted unsuccessfully with De Bréauté to surprise the Tower and obtain the dismissal of Hubert de Burgh, but ultimately submitted. He took part in the siege of Nantes in 1230, and was left in Brittany with Aumâle and William Marshall in charge of the army. He returned to England in 1231.

Blunt, John Henry (1823-84), a theologian and priest, was born at Chelsea, and was for some years engaged as a manufacturing chemist. In 1850 he went to Durham University, being ordained deacon two years later. In 1868 he was appointed Vicar of Kennington, and in 1873 he received the crown living of Beverstone. His works include an annotated edition of the Book of Common Prayer (1867), *History of the English Reformatio* *Doc-trinal and* 870), and a *Dict*;

Blunt, John James (1794-1855), an Eng. divine, born at Newcastle-under-Lyme, and educated at St. John's College, Cambridge. In 1816 he graduated fifteenth wrangler and obtained a fellowship. Till 1834 he held *curacies in Shropshire, but at that* date he became rector of Great Oakley, Essex. In 1839 he was made Lady Margaret professor of Divinity at Cambridge, and in 1854 he was offered, but declined, the bishopric of Salisbury. *His best known work was Undesigned Coincidences in the Writings both of the Old and New Testaments* (1833). *See* Professor Selwyn's *Memoir* of him (1856).

Blunt, [illegible] traveller [illegible] worth House, Sussex. [illegible] of Francis Scawen B., and was educated at Stonyhurst and St. Mary's, Oscott. From 1858 to 1869 he was in the Diplomatic Service. In the latter year he married Lady Anne Noel, daughter of the Earl of Lovelace and grand-daughter of Lord Byron. In 1872 he succeeded to the Crabbet estates on the death of his elder brother. He then travelled for some years in the E. with Lady B., visiting Arabia, Syria, Algeria, Egypt, Persia, etc., and some of these voyages are described in books by Lady B. In 1885 and 1886 he unsuccessfully contested Cambridge in the Home Rule interest, and in 1887 he was arrested and imprisoned for two months in Ireland, in connection with agitations on Lord Clanricarde's estates. His best known vol. of poems is the *Love Sonnets of Proteus* (1880); and his most considerable historical work *The Secret History of the English occupation of Egypt*. Among his other works may be mentioned: *The Future of Islam*, 1882; *The Wind and the Whirlwind*, 1883; *In Vinculis*, 1889; *Esther*, 1892; *Griselda*, 1893.

Bluntschli, Johann Kaspar (1808-81), Ger. jurist, was born at Zurich, and studied at the universities of Berlin and Bonn, at the latter of which he graduated LL.D. in 1829. He then returned to Zurich and took a prominent part in the political war which was then disturbing Switzerland. He became professor of law at Zurich University, and became also a member of the parliament. Here he was soon recognised as leader of the moderate Conservative party. The impossibility of bringing about a general acceptance of his views on gov. led him to resign, and in 1848 he went to Munich, where he became professor of constitutional law. Here he pub. his chief work on jurisprudence, the *Allgemeines Staatsrecht* (5th ed. 1876). In 1861, B. [illegible] of political where he aga arena. *It is* begins to rank as one of the greatest authorities [illegible] In 1873 he of Internatio and *some years later he became a leading* member of the *Protestantenverein*. Among his works are: *Geschichte der Republik Zürich*, 1847; *Das moderne Kriegsrecht*, 1866; *Das moderne Völkerrecht*, 1868.

Blushing is a sudden suffusion of blood over the skin, caused by sensations of shame or modesty. Usually *it affects only face and neck, but* among savages sometimes arms and chest also. It produces heat and a *discomfort*, and *serves to* the intimate control exercised by the nervous system over the blood.

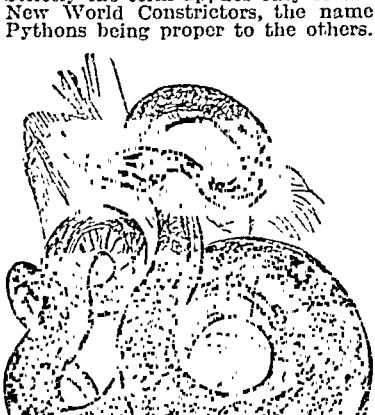
Blysmus is a genus of Cyperaceæ now included in Scirpus. *B. compressus* is found in boggy pastures of Scotland and England; *B. rufus* inhabits marshes near the sea.

Blyth, seaport of Northumberland, England, 9 m. E.S.E. of Morpeth, at mouth of R. Blyth. It exports the coal mined in the dist., and does some shipbuilding. It is becoming known *as a watering-place. Pop. (1901) 5172.*

Blyth, Sir Arthur (1823-91), Premier [illegible] was born and educated *to S.* engaged in business as an ironmonger in Adelaide. He became member of Adelaide Chamber of Commerce and member for Yatala district in the Legislative Council in 1855. He was member for Sumeracha in the first elected council in 1857 and 1870;

Commissioner of Works for ten days in 1857 and again from the middle of 1858 to the middle of 1860; Commissioner of Lands and Immigration, 1864-5; Chief Secretary and Premier, 1866-87. He was again elected Premier in 1871-2 and 1873-75. He was member for N. Adelaide in 1875, and Agent-General for the Colony in England in 1877. He was created K.C.M.G. in 1877 and C.B. in 1886.

Boa, name popularly given to any of those large snakes of America and the Old World which, having no poison fangs, kill by constriction. Strictly the term applies only to the New World Constrictors, the name Pythons being proper to the others.



BOA

The Boidæ are distinguished from the Pythons by the presence of teeth in the premaxillæ and the absence of supraorbital bones. Both are large in size, with expansible gape and prehensile tails; moreover they possess traces of the pelvis and bones of the hind legs, which appear as small claw-like spurs on each side of the vent. The commonest of the species is the *Boa constrictor*, about 12 ft. in length, brownish-grey in colour with lines and blotches. The B. attacks even large mammals, crushes the bones of its victim by pressure, covers it with saliva, and swallows it whole. A long period of torpor follows. Most of the boas bear their young alive.

Boabdil, from the name Abu Abdullah, was the last Moorish king of Granada, called also *El Chico*, which means 'The Little.' In 1482 his father, Abu'l Hassan, was dethroned and banished from the country, and B. was proclaimed king. In 1483 he invaded Castile, but was captured at Lucena, and became tributary to Ferdinand and Isabella of Castile. After that he spent several years in warring against his father and his uncle. In 1492 the King of Castile, after besieging Granada, captured it. Eventually B. crossed to Africa and was killed while warring in that country. El Ultimo Suspiro del Moro ('the last sigh of the Moors') is shown as the place from which B. last viewed Granada. *See* J. A. Condé, *Historia de la dominacion de los Arabes en España Sacada de varios manuscritos y memorias Arabigas*, 1820.

Boac, or **Boag**, a tn. on W. coast of Marinduque Is., Philippines. Pop. over 14,700.

Boaden, James (1763-1839), journalist, editor of the *Oracle* newspaper in 1789. He studied at the Middle Temple, wrote several successful plays, and in 1796 published an exposure of the Ireland Shakesperian forgeries. In 1851 he published a work on Shakespearian sonnets, identifying Mr. W. H. with William Hubert (afterwards Lord Pembroke). He also wrote biographies of actors and actresses.

Boadicea. Strictly the name should be Bondicca, a name which in Celtic is practically the equivalent of Victoria. She was the wife of a British king named Prasutagus who seems to have ruled over the Iceni in E. Anglia. Dying, he made his wife and daughters joint heirs with the Rom. emperor to his property, probably from a mistaken idea that this would save them at least some share of his possessions. In place of this, however, his queen was insulted, his daughters outraged, and his subjects goaded by insult and oppression into rebellion. Suetonius Paulinus was with the legions suppressing the Druids of Mona. E. Anglia burst into the flame of rebellion. St. Albans and Colchester were annihilated, London razed to the ground, and the storm of British fury swept all before it. Paulinus returned, and tried to stem the rebellion. Collecting all his forces, save the legion from Caerleon whose general failed to obey orders, he met the Britons at some unknown place, but probably a place between London and Chester, and practically annihilated them. B. took poison, her troops were cut down practically to a man, and the Romans crushed all life out of the rebellion. Henceforward there was peace in Britain, but to a very great extent the peace of desolation. The Romans, however, shortly after introduced more humane methods

into their treatment of the conquered races.

Boanerges, a name given by Christ to his two disciples, James and John, the sons of Zebedee. *See* Mark iii. 17. The word is interpreted in the Bible as 'sons of thunder,' and was probably applied as denoting strength of character and zeal.

Boar, Wild. The commonest species is the *Sus Scrofa*, larger in size than the modestic pig, and characterised by its long tusks, prominent pig-like snout, and short, thick, woolly hair closely interspersed with bristles, which on the neck form a thick mane. These bristles are brownish-black in colour, the shorter hairs being grey. The animal is about 3 ft. in height, and far surpasses the domestic swine in strength and swiftness. It is native in Europe, and is now found over Europe, N. Africa, and parts of Asia. It was originally common in the British Isles, and traces of it are found at Chartley Forest, Staffordshire, as late as 1683, and it survived even later in Ireland and Scotland. It is still found in most parts of the continent, where it is common in damp and marshy ground. Bs. in early times proved very destructive to crops, for they are voracious and omnivorous, and feed chiefly by night. Solid benefit was, therefore, to be gained by hunting them, and their ferocity gave the business the touch of danger necessary to make it a sport. Under the Norman kings the B. was one of those beasts the killing of which without right was punishable by death. B.-hunting was then a lordly sport, and a vivid account of its pleasures is given in the fourteenth work of *Sir Gawayne and the Green Knight*. The B. was hunted on foot and on horseback with dogs, most commonly B.-hounds. The B.'s head was then accounted a great delicacy, and its entrance at the Christmas festivities was greeted with elaborate ceremonial and many carols. In heraldry, it is a well-known cognisance. Other species of *Sus* are known, the *Sus villatus*, the *Sus Verrucosus*, and the *Sus Barbatus*, all Asiatic.

Board. The name which is generally given to a body of persons appointed jointly to control some public office, bank, or railway. Thus, for example, when referring collectively to the directors of a railway or a bank it is customary to refer to the B. of Directors. Similarly the Lords of the Treasury form the B. of Treasury, whilst the name is in common employment, having the same meaning, in such terms as the B. of Guardians, the Local Government B., the B. of Trade, and in Scotland the School B. The chief State departments bearing this name are the B. of Agriculture and Fisheries, the B. of Trade, the B. of Education, the B. of Works, and the Local Government Board.

Board of Agriculture and Fisheries.—The B. of Agriculture and Fisheries has been in existence since 1889. It owed its origin to a special department of the Privy Council created in 1865 to look after and control the agricultural interests of the country. The immediate cause of the appointment of this Veterinary department, as it was called, was the outbreak of the cattle plagues which ravaged England during the middle of the sixties of last century. In 1883 the term agricultural was applied to the committee, and in 1889 the B. was actually formed. The agricultural interests of this country had long called for the appointment of such a board, and these interests are now vested in the B. itself. The B. is controlled by a president, who is a responsible minister and who sometimes holds cabinet rank. His appointment is purely political, and changes naturally with a change of government. The members of the B. are the President of the Council, the Secretaries of State, the Secretary for Scotland, the first Lord of the Treasury, the Chancellor of the Exchequer, and the Chancellor of the Duchy of Lancaster. The presidency carries with it a salary of £2000 per annum, and is at present occupied by a minister holding cabinet rank (1913). In addition, a Parliamentary Secretary, who has a salary of £1200. The B. has the responsibilities entailed by the Contagious Diseases Act, and acts quickly in order to prevent the outbreak or spreading of these diseases amongst cattle, as was exemplified in 1912, when the dreaded foot and mouth disease broke out. It controls also the agricultural, horticultural, and foresting interests of the country. It has also indoor and outdoor animals departments, a fisheries department, a veterinary department, and an educational department, which is now being developed much more rapidly than formerly. It controls also the Ordnance Survey of the United Kingdom.

Board of Trade.—This B. also had its origin in a departmental committee of the Privy Council, although such a B. can be traced practically back to the time of Edward I. Councils and committees often advised the Crown on the regulation of trade and commerce, but these councils had no permanence until the period of the Commonwealth. They remained in existence during the early reign of Charles II., but fell into disuse towards the end. The restora-

tion of the coinage in 1695 was due to the work of Locke, who had been appointed secretary of the B. of Trade, which was revived by William III. The B. underwent many vicissitudes during the 18th century. Finally, towards the end of the century, it assumed very much the same form as it has at the present day. The growth of commerce and industry during the 19th century, however, raised the status of the president of the B. to an equality with the principal secretaries of the State, but their status was not recognised officially until 1909, when by the Board of Trade Act the salary of the president was brought up to £5000, the same as that paid to the secretaries of State. In addition to the president there is a permanent secretary, a parliamentary under-secretary, and four assistant secretaries. For the past thirty years the president has with few exceptions always been of cabinet rank. The principal members of the cabinet form the B. It has many departments, *e.g.* the commercial, labour, and the statistical department, the railway department, the marine department, the harbour department, the finance department, and the bankruptcy department. Until 1903 it had also a fisheries department, but in that year its duties in connection with fisheries were passed over to the Board of Agriculture.

Board of Education.—This B. had its origin in the appointment in 1886 of a minister responsible to parliament. This office was originally held, according to the provisions of the Bill passed in the above-mentioned year, by the vice-president of the Committee of Council on Education, and at the same time as a minister was made responsible the department of science and art was taken from the hands of the B. of Trade and given to the control of the committee. The Board of Education Act of 1899 abolished this office of vice-president of the council and created a president of the B. of Education, which was the department of education and of science and art united in one committee. In addition to the president there was also a parliamentary secretary appointed. The B. underwent a still further change in 1902, when it was divided into three definite divisions, to control respectively, primary, secondary, and technical education. The president is usually of cabinet rank, and has a salary of £2000.

Board of Works and Public Buildings.—A development of the office of commissioner of woods and forests. It is now held by a responsible minister, who has usually a seat in the cabinet. The head of the B. is the first commissioner. The duty of the B. is to look after all public buildings, royal palaces, and parks. The first commissioner has a salary of £2000, and has also a representative in the House of Commons, also with a salary of £2000.

Boarding, with regard to naval tactics, is a term used for an assault made by one ship upon another. It is now, however, not much practised. B. may be performed on different parts of the ship according to the position of the ships.

Board of Trade Unit, the unit of electrical current legally established in the United Kingdom. It is approximately one-tenth of the theoretical *ampere* (*q.v.*), and is defined as that amount of continuous unidirectional current which when flowing through a neutral solution of silver nitrate deposits on the cathode or negative pole ·001118 of a gramme of silver. As regards alternating currents, the unit is measured as being the current which produces in a fine wire the same amount of heat in the same time as a unit of continuous current as determined by the silver-nitrate test.

Boar-fish (*Capros*), genus of fishes chiefly found in the Mediterranean. It has a flat oval body, similar to that of the related John Dory. Its body is carmine, with seven transverse orange bands on the back, and the name is derived from its projecting hog-like snout.

Boarmia, a genus of lepidopterous insects of the family Geometridæ. All the species of these moths are of an ashy colour, or white minutely dotted with brown, and the large wings, when at rest, are placed horizontally. Many species are found near London.

Boase, Charles William (1828-95), historian, B.A. and fellow of Exeter College, Oxford, in 1850, M.A. in 1853; was ordained deacon in 1855. During years 1859-69 he was lecturer in Hebrew at Oxford, and 1854-94 in modern history. He was university reader in modern history during the years 1884-94. In 1884 he was made hon. secretary of the Oxford Historical Society. He published historical works relating to Oxford and other writings, including a translation of Ranke's *History of England*.

Boat (O.E. *bât*), a comparatively small open vessel used for travel on the water, generally propelled either by sail or by oar. The term 'ship' is generally reserved for larger vessels. The origin of vessels for conveyance on water may doubtless be traced to a double genesis. When primitive man wished for some such thing, two

means must have suggested themselves to him. He could hew down a tree and hollow it out, or he could collect wood and bind the pieces together. Hence arose the 'dug-out,' still so common a B. among savage tribes, and the raft, the construction of an elaborate form of which is described at length in the *Odyssey*. From this last come the junk and punt and all the various kinds of flat-bottomed craft. Another stage in development may be the coracle of the ancient Celts, consisting of a wicker framework over which skin is stretched. By another step, the framework would be made stronger and the covering made of wood. There are differences in the ways of laying on the planks in the modern small B., viz., the planks may be laid edge to edge, so as to present a smooth exterior; the B. is then said to be carvel-built; the plank overlap, and the B. is descri clinker-built. Naturally, the types of Bs. are countless in n... for they vary in every part of the world and in the same part for every different class of work. Some are needed swift, some roomy, some for pleasure, some for rough weather; the enumeration is endless. In the royal navy the following Bs. are used, though here, as in other branches of service, steam and the motor are taking the place of wind and oar, which now propel only the smallest Bs. The *pinnace*, a B. used for the sub-officers, is generally about 35 ft. long, carrying eight oars. The *cutter*, about 30 ft. long, carries more men and has greater breadth. The *gig* is used on expeditions requiring speed. It is narrower than the pinnace, is 30 ft. in length, and weighs about 8 cwt. The *dinghy* is a small B. of 3 cwt., about 13 ft. long, and easily rowed by two men. Bs. vary considerably in shape and size round our coast. On the Thames they are lightly built, but on the coast the necessity of pulling them up over rough ground demands that they should be strong and generally clinker-built. Round the coast of Kent and Sussex short square-sterned skiffs are in favour, and further W. along this coast the Bs. get deeper and larger, and the carvel-build is still common. In the N.E. of England and at the N. of Scotland various old types of Bs. survive. The *coble*, for example, is a shallow-built, flat-bottomed B. with a very curious rudder, built for launching from the beach in rough weather. These show traces of Norse and Dutch influence. Pleasure Bs. of most kinds may be seen on the Thames, and the following are easily noticeable: the Randan skiff about 30 ft. long, 4 ft. beam, and various skiffs, eights, fours, gigs, and punts. These are of varying degrees of lightness, and this type finds its best expression in the racing eights seen in the Oxford and Cambridge boat race.

Boat, Life, *see* LIFE-BOAT.

Boatbill, or Boatbilled Heron, is the popular name of *Cancroma cochlearia*, a bird belonging to the Ardeidæ, or heron family, but differing from allied species in its broad, flat, brown bill. It is a night-flying bird, feeds on fish and worms, and is a native of Brazil.

Boate, Arnold (1600-53), Hebraist, was brother of Gerard B., the physician. Arnold studied at Leyden and obtained his medical degree. He also studied Hebrew and rabbinical writings, practised medicine at Dublin, and was physician-general to the English forces in Ireland. He removed to Paris, and published in 1644 his *sacræ ad textum Testamenti*. He ...ral medical works. 604-50), physician, born at Gorcum, Holland. He obtained his M.D. at Leyden University in 1628, and afterwards settled in London. He became physician to the king. In conjunction with his brother he produced a treatise depreciatory of the Aristotelian philosophy in 1641. In 1649 he was doctor to the hospital at Dublin. He also wrote *Ireland's Natural History*, which was published posthumously.

Boat-fly is the name of sev. species of hemipterous insects of the family Notonectidæ. They are aquatic, swim on their backs, live on animal matter, hibernate in mud, and when they dive into water carry with them a supply of air. *Notonecta glauca*, the water-boatman, is found in Britain.

Boat-plug is any conical piece of wood or cork which is used to fit into a hole in the bottom of a boat. This hole is made for the convenience of letting out of the boat the water—which may be rain or sea water—that has made its way into it. When the boat is hoisted the plug is removed, but it is replaced when the boat is lowered for use.

Boat Race, *see* ROWING.

Boatswain (pronounced 'bo'sun, *from boat* and *swain*, a servant), an officer in the royal navy, of warrant rank. In the days of sailing ships, he had charge particularly of the boats, rigging, sails, cables, anchors, flags, and cordage. It was his duty to examine these carefully, especially when the vessel was in dock, to keep them in a state of repair, and to make report of their number and condition. By means of his whistle, which gradually came to be looked on as his badge of office, he summoned the crew to

their duties. He shared in the work of the ship, and took a place in one of the watches. He himself gives no orders, but acts as the officer of the first lieutenant. His work has of course been considerably modified by the general use of steam.

Boavista, in Brazil, 320 m. S.W. of Georgetown. It lies in the central part of N. Brazil, on the banks of the Rio Branco.

Boavista, or Bonavista, an is. of Africa, the easternmost of the Cape Verde group. It has a railway and three ports—Porto Sal Rey on the W., Porto do Norto on the N., and Porto Curralinho on the S. The soil is not fertile, and the cultivation is generally neglected. Area 250 sq. m. Pop. about 4000.

Boaz, a Bethlemite from whom Jesus Christ was a descendant in the direct line. He married Ruth, and they were the great-grandparents of David.

Boaz and Jachin (*see* 1 Kings vii. 21), the names given to two brazen pillars in the porch of Solomon's temple in Jerusalem.

Bobadil, Captain, in Ben Jonson's comedy, *Every Man in his Humour*. He is a bragging, blustering fellow.

Bobbili, a tn. of British India. It is situated in Madras presidency, 36 m. from Chicacole to the W.N.W.

Bobbin, a small wooden or metal roller, flanged at both ends (rarely at one only), and bored through the axis, so that it may be placed on a spindle. The commonest form is the spool on which ordinary sewing thread is wound, and an example of the metal B. is to be found in that which carries the thread in a sewing machine. Bs. of various sizes and shapes are used for the different stages of spinning flax, wool, yarn, etc., the largest being those used for the slubbing frames, where the cotton passes from the lap shape in which the carder has left it into loose strands. These are often 15 in. long. Paper tubes are now often used where Bs. were originally employed. In lace-making and some other industries a peculiar type of metal B. is used.

Bobbio, a tn. and episcopal see of Lombardy, Italy, in prov. of Pavia. Its origin is traced to a monastery erected by St. Columban in 612, whose famous library, now mostly at the Vatican, the city once possessed. Other parts of the library are at Milan and Turin, but many important documents still remain at the cathedral. Pop. (1901) 4848.

Bober, riv. of Silesia and Brandenburg, Germany, the chief trib. of the Oder. It rises on the N. side of the Riesengebirge, and after passing Landeshut, Bunzlau, and Sagan, flows into the Oder after a course of 160 m. at the town of Crossen.

Boblingen, a tn. of Germany, situated in the state of Würtemberg. It is situated 11 m. to the S.W. of Stuttgart, and has a pop. of 3826.

Bobolink is the name given to a N. American bird of the family Icteridæ; it is the *Icterus acripennis* of Bonaparte and *Dolichonyx oryzivorus* of Swainson. It differs from the orioles or starlings in having a long middle toe and pointed tail-feathers, and is noted for its curious song. Others of its names are rice-troopial, reed-bird, skunk-bird, and rice-bunting.

Bobrek, a tn. of Prussia in the prov. of Silesia; pop. about 5000.

Bobrinets, a tn. of Russia, about 120 m. N. of Kherson; pop. 14,000.

Bobrov, Semen Serægevitch (*d.* 1810), Russian poet. His only work of importance is *Khersonida*, a poetical history and description of Taurida in South Russia.

Bobruisk, tn. in the gov. of Minsk, Russia, formerly an important fortress. It is on the Beresina and possesses a railway station. It was unsuccessfully bombarded by Napoleon in 1812, and its fortifications were then increased. They have now been abolished as antiquated. Pop. (1897) 35,177.

Bocage was formerly the name of two dists. in France; the first, Norman B., formed the middle part of Bessin below the Orne, but is now part of Calvados. The second, Vendean B., formed part of the prov. of Poitou, but now is included in the dept. of Vendée.

Bocas del Toro, or Boca del Toro, a tn. and port of Panama, situate in the lagoon or bay of Chiriqui. The bay forms a good natural harbour and the surrounding country is very fertile, producing fruits, cocoa-nuts, and india-rubber. The pop. is about 5000.

Boccaccio, Giovanni (1313-75), It. writer, born at Paris and apprenticed to a merchant there, but disliking commerce, settled down to verse-writing at Naples. Here, about 1334, he fell in love with Maria d'Aquino, said to have been a natural daughter of King Robert of Naples, who appears in many of his works as Fiametta. He went to Florence in 1340, and returned there in 1349 after spending some years in the Romagna. In 1350 he formed a friendship with Petrarch, by whom he was much influenced. The latter part of his life was mainly spent at Certaldo, but in 1365 he went on an embassy to Avignon, in 1367 on one to Rome, and in 1368 visited Petrarch. His works, in which he was an ardent exponent of the new learning, were numerous and varied. He is best known by the *Decameron*,

1348-58, a collection of prose tales, supposed to have been told by courtiers and ladies in retirement during the plague at Florence in 1348. This work showed an enormous advance in style and [illegible] fiction [illegible] pean [illegible] extent. He also wrote numerous romances and pastorals in verse and prose, and several Latin treatises.

Boccage, Manoel Maria Barbosa de (1765-1805), Portuguese poet, born at Setubal. Though from the beginning he showed a remarkable talent for versification, he entered the navy, and his adventures carried him as far as Brazil and the Indies. Before this, his numerous love affairs had given plenty of scope for the exercise of a special gift, but on his return the style of his verse had [illegible] satire. He was endowed with great powers of improvisation, and his poems are full of harmony. Though he wrote eclogues, idylls, epistles, songs, etc., it was in the sonnet that he excelled and gained a place about the best writers of this genre in Portugal. He also left a number of unfinished tragedies and some translations. His works were published in eight volumes in 1875-6.

Boccage, Marie Anne, Lady Fiquet du (1710-1802), a Fr. poet, wrote an imitation of Milton, entitled *Le Paradis Terrestre*, 1748. She went to Ternary to visit Voltaire, who praised her fulsomely, but whether the praise was sincere or not has been disputed. Her other works are *La Colombiade*, 1756; *Letters Concerning Voltaire*, 1770.

Boccalini, Trajano (1556-1613), an It. satirist, was governor of several towns of the papal states between 1608 and 1611. He retired to Venice and spent his last years in writing poetry. He was hostile to the Spanish nation, and in fact the only government which he did not attack in his writings was that of Venice, for which he appears to have had an affection. His principal work is *News of Parnassus* (*Ragguagli di Parnaso*), a satirical work dealing in a brilliant fashion with contemporary questions and personages, both private and political. An Eng. version of this, together with the sequel, *La Pietra del Paragone Politico*, which was left unfinished by him, was published in England by Henry, Earl of Monmouth. The story that he was sandbagged to death by a band of Spanish bravadoes has no foundation in fact; he died from the effects of colic and fever at Venice.

Boccanera, Simone, Genoese statesman of 14th century. He was elected Doge of Genoa for life in 1339, but compelled to resign in 1344, and lived in retirement at Pisa till 1356, when he was re-elected. He is said to have been poisoned. He gained numerous victories over the Turks, Tartars, and Moors.

Bocca Tigris (Portuguese form of the Chinese *Hu-mun*, tiger's mouth), part of the estuary of the Canton R. On an is. in it are the Bogue forts, taken by the British in 1841 and 1856.

Boccherini, Luigi (1740-1805), an It. [illegible] sons fro[illegible] ter- wa[illegible] his art, and then to Paris. He subsequently went to Spain, where he was highly honoured by the king, and he also received a pension from Frederick William II., King of Prussia. He is [illegible] as a master of chamber [illegible] r writing anything for the [illegible] only one mass, the *Stabat Mater*. His compositions include, however, duets, trios, quartets, quintets, sestets, symphonies, and sonatas for the violin, the violoncello, and the pianoforte.

Bochart, Matthieu, French Protestant divine of the 17th century. He was the author of a *Treatise against Relics* and *Diallacticon* (pub. 1662), in which he advocated the union of the Lutheran and Calvinist sections of the Protestant body.

Bochart, Samuel (1599-1667), a Fr. theologian and philologist, was pastor of a church at Caen. He took part in 1629 in a discussion with a Jesuit named Veron, and worsted him. His *Sacred Geography*, which he pub. shortly afterwards, added so much to his fame that Queen Christina of Sweden invited him there. He went to Stockholm and remained there for a year, and on his return in 1653 was named a professor at the recently-founded academy of Caen, a post which he held till his death. He had a great reputation in his time as a theologian, a geographer, a philologist, and a naturalist. His works include: *De Animalibus Sanctæ Scripturæ*, 1663; *Reply to the Letters of M. de la Barre, Jesuit*, 1662, etc.

Bochmann, Gregor von, Russian painter, born at Nehat, Esthland (Esthonia), 1850. He is a landscape painter, and studied from 1868 at Düsseldorf Academy, having a studio there, 1871. He takes yearly study-trips to his native land, Holland, and Belgium. Among his works are: 'Church in Esthland,' 1874; 'Sluice in Holland,' 'Potato Harvest in Esthland,' 'Fishmarket at Reval,' 'Wharf in Holland,' 1878 (Berlin National Gallery), 'On a Country Road.' *See* Müller, 58; Brockhaus, iii. 220.

Bochnia, a tn. of Galicia, Austria-Hungary, about 25 m. by rail S.E. of

Cracow; has salt and gypsum mines in the vicinity. Pop. (1900) 10,049.

Bocholt, a tn. of Germany in prov. of Westphalia (Prussia), on the riv. Aa, 12 m. N. of Wesel. Manufs. of iron and cotton. Pop. 22,000.

Bochum, a tn. of Germany, prov. of Westphalia (Prussia), 35 m. N.E. of Dortmund. It is an important industrial centre, particularly of the iron and steel industries. It produces armour plates, machinery, wire-ropes, etc., and has also breweries, felt and brick manufs. There are coal mines in the vicinity. Pop. of district 118,000.

Bockenheim, industrial suburb on N.W. side of Frankfort-on-the-Main.

Böcking, Eduard (1802-70), a Ger. lawyer, born in Trarbach. He was appointed professor of law at Bonn in 1835, and wrote on many legal subjects. His pub. works include *Notitia Dignitatum Utriusque Imperii* in 5 vols., 1839-50, and *Institutionen des Römischen Privatrechts*. He also ed. the works of Ulrich von Hutten.

Böckingen, a tn. in the dist. of Heilbronn in Würtemberg, Germany; pop. about 6000.

Böcklin, Arnold (1827-1901), Swiss painter, son of a silk-worker at Basel. In 1845 he went to study at Düsseldorf, under Schirmer, who, recognising his talent, sent him later to study the works of the Flemish and Dutch school at Antwerp and Brussels. Going thence to Paris, he worked for some time at the Louvre, and afterwards resided for some years in Rome, where he married. He was very fond of studying nature in the Campagna, and his landscapes are mostly Italian in character and feeling. In 1856 he went to Munich, where his first great success, 'Pan among the Reeds,' was exhibited and bought for the Pinacothek. This and other mythological pictures gained him an appointment at the Weimar Academy, which he held for two years. In 1862 he returned to Rome, where he painted 'A Roman Tavern,' 'A Villa on the Sea-shore,' and other fine pictures. Going back to Basel in 1866, he adorned the gallery there with some frescoes, besides painting 'Christ and the Magdalene,' and other pictures. From 1871 to 1874 he was in Munich, where, going beyond the bounds of classical mythology, he introduced such wonderful imaginary beings into his compositions that they awakened much hostile criticism; however, in time their brilliant colouring and fine idealism overcame opposition. Returning to Italy, he worked at Fiesole and at Florence, where he died.

Boc-land (from A.S. *bōc*, a book, *i.e.* book-land), an early Eng. method of land tenure, better described now as charter-land or deed-land. B. was folk-land which was allotted by deed to some person in private ownership by the king and council. It differs from the *Ethel* (Eng. homestead), which was land cut off from the folk-land and made the perpetual possession of its owner and his descendants, and which depended on no charter for its possession. B. could be held by the king or by ecclesiastics, and less frequently by a lay subject. It was often granted in perpetuity to a church or monastery, for which it could be held in trust by a layman. During the lifetime of its owner it could be alienated or disposed of, but only by *boc*, as it had been received.

Bocskay, Stephen, Prince of Transylvania (1556-1606). He was the leader of a successful rebellion against Rudolf II. of Hungary in 1604, and proclaimed Prince of Transylvania by the Sultan Ahmed I. Two years later a peace was concluded with Rudolf, granting freedom of religious worship to the Protestants of Hungary.

Bod (Boad), a trib. state of Orissa, India. It is bounded on the N. by the R. Mahanuddy. Its area is 2064 sq. m. B. proper is ruled by a native rajah. Its cap. is Bod, a tn. situated on the Mahanuddy. Its pop. is 108,868.

Boddam, a fishing vil. situated 3 m. S. of Peterhead, N.E. Aberdeenshire. Pop. 1972.

Bode, The Barons de, are known in England because of a claim for indemnity often presented before parliament. A certain de B., born of a baron of the Holy Roman Empire and an Eng. mother, was included among those who were to be indemnified for confiscations at the time of the Revolution from the payment made by France in 1814. In 1852 the gov. refused to recognise the claim preferred by this man's son, because he was not a British subject and his lands had been held under German tenure.

Bode, Johann Elert (1747-1826), a Ger. astronomer, born at Hamburg, is famous for many astronomical publications. He was devoted to the subject from his early youth, and in 1772 was made astronomer of the academy at Berlin. In 1786 he was made director of the observatory there, and he held this position till 1825. His name is best known as the propounder of B.'s Law, on the proportion of the respective distances of the planets from the sun. The law states that the proportionate distances of the planets from the sun is found by adding 4 to each term of the series 0, 3, 6, 12, 24, etc., which omitting the first term forms a geometric series with 384 as

last term. When he first advanced this rule, which still remains empirical, it was found that a planet should occur between Mars and Jupiter, and a group has now been discovered there. The rule, then, holds good, excepting its application to Neptune, whose distance from the sun is less than B.'s Law requires. Among B.'s works may be name[illegible] *zur Kenntniss des gestir* (1768), *Sammlung* *Tafeln* (1776), *Erläuter* *kunde* (1776), *Uranographia* (1801).

Bodegas, or **Babahoyo**, a tn. and the cap. of Los Rios in the prov. of Los Rios, Ecuador, 35 m. N.E. of Guayaquil.

Bodenbach, a tn. of Bohemia, Austria, on R. Elbe, near the Saxon frontier, and on the opposite bank to Tetschen. The two tns. are connected by bridges. Pop. of commune (1900) 10,872.

Boden-See, *see* CONSTANCE, LAKE.

Bodenstedt, Friedrich Martin von (1819-92), a German poet, journalist, translator, and dramatist, was born at Peine, in Hanover. After studying at various German universities, he was appointed tutor to the family of Prince Gallitzin at the city of Moscow, 1840. In 1844 he transferred himself to a new appointment at Tiflis in Transcaucasia. Here he devoted himself to a thorough study of Persian literature and of that of the Orient generally. From this sprang the most popular of his works, *Die Lieder des Mirza Schaffy* (1851), a vol. of original poetry which purported to be trans. from an eastern work. Its success in Germany was enormous, equal to the somewhat later success of Edward Fitzgerald's translation of Omar Khayyam's *Rubaiyat* in England. Its fame, indeed, is great in most languages of Europe, for it has frequently been trans. In 1854, after some years spent in journalistic work, he was made professor of the Slav languages at Munich. For some time he continued at this subject, and trans. many works of the Slavonic authors. In 1858 he gave up this post and took the chair of Old Eng. During the years that followed, he pub. a translation of Shakespeare's plays and poems, and several other valuable works on Eng. literature. In 1867 he left Munich and was employed till 1873 as director of the Court Theatre [illegible]'s voluminous *ies Caucasus* *upfe gegen de* *und ein Tag* *im Orient* (1850).

Bodichon, Madame (1827-90), born Barbara Leigh Smith, the daughter of Benjamin Smith, many years M.P. for Norwich, she married Eugene B., M.D., in 1857. She was a strong sympathiser and advocate for women's rights, and took much interest in university education for women, being one of the founders of Girton College. She was also a talented painter of landscapes in water-colour.

Bodin, Jean (1530-96), Fr. philo- ad economist, was born at Having studied law at he himself became pro- jurisprudence at that university, until in 1561 he came to Paris to secure the favour of the king. Before this he had trans. Oppian's *Cynegeticon* into Lat. verse with a commentary. In 1576 he was made king's advocate at Laon, and in the same year he was elected by the *tiers état* of Vermandois as its delegate to the States-General of Blois. In this assembly he defended with the greatest vigour and eloquence the rights of the people against all restrictions, whether imposed by king, clergy, or nobility. In 1581 he visited England as secretary to the Duc d'Alençon, when the duke was seeking the hand of Queen Elizabeth. On his return the rest of his life was spent at Laon, where his influence was such that he persuaded the citizens to declare for the League in 1589 and for Henry IV. in 1594. He died of the plague. His greatest work was the *Six Livres de la République*, 1576, the first important attempt in modern times to construct a complete system of political science. His *Methodus ad facilem historiarum cognitionem* is the foundation of the present method of studying history. Other works of his are: *Oratio de instituenda in republica juventute*, 1559; *Universale Naturæ Theatrum*, 1596; and the *Colloquium Heptaplomeres de abditis rerum sublimium arcanis*, pub. 1857. Though so liberal in opinion as to be accounted an atheist, B. was a firm believer in witchcraft. *See* H. Baudrillart's *J. Bodin et son temps*, 1853; Bardoux' *Les legistes et leur influence sur la société française*, 1887.

Bodle, or **Boddle**, an anct. Scottish copper coin of time of Charles II., worth about one-sixth of an Eng. penny, or twopence Scotch. Its name is said to be derived from Bothwell the mint master. *Word only survives* in the phrase 'not to care a bodle.'

Bodleian Library. This public library of Oxford owes its origin to Sir Thomas Bodley. There had previously been a university library there, but this was reformed and enlarged by the addition of numerous books by Sir Thomas Bodley in 1598. In addition to the contributions which he himself gave, he also induced others to contribute largely, and in

1602 the library contained about 2000 vols. When Bodley died he left a considerable amount of property to increase the library and to maintain it. His example found many imitators, and amongst the great patrons of the library may be mentioned Archbishop Laud, Lord Fairfax, Richard Gough, Richard Rawlinson, and Rev. Robert Mason. The library is excelled by few in Europe, and its Oriental MSS. are probably unsurpassed in the world. It contains the most valuable documents for the history and literature of the country. The library has now well over 750,000 vols. and over 40,000 MSS. By various copyright acts it has the right to a copy of every vol. entered at Stationer's Hall. No artificial light is allowed to be used in the library, and the only part of the library in which this is used is in the Radcliffe Camera, added to the library in 1860, and now used as a reading-room.

Bodley, John Edward Courtenay (*b.* 1853), an Eng. historian, educated at Balliol College, Oxford, taking the degree of B.A. in 1877 and M.A. in 1879. He was called to the Eng. bar in 1874, and from 1882 to 1885 was private secretary to the president of the Local Government Board. Has pub. a work in 2 vols. on France: Vol. i. *The Revolution and Modern France;* Vol. ii. *The Parliamentary System;* and in addition *L'Anglomanie et les traditions françaises* and *The Coronation of Edward VII.*, the last work being written by His Majesty's command. He has also contributed papers and short writings.

Bodley, Sir Thomas (1545-1613), an Eng. diplomatist, was educated at Geneva and Merton College, Oxford. He was made a fellow of his college, and in the years between 1580 and 1597 he was employed in various embassies to European countries. He returned home in 1597, and spent the rest of his life in augmenting the public library at Oxford. He was knighted at the accession of James I. He bequeathed almost all his possessions to the library, for further details concerning which, *see* BODLEIAN LIBRARY.

Bodmer, Johann Jakob (1698-1783), a Swiss poet and man of letters, was professor of history at Zurich from 1725 to 1775, and a member of the Grand Council there. He founded a weekly critical periodical, which had for its aim the freeing of literature from the shackles of pedantry and rigid adherence to rules. He did much by his contributions as a journalist and critic to create a Ger. national literature free from foreign influences. The new movement made its way slowly but surely till it was espoused by Lessing and others. B.'s works include *Noachide*, 1752, an indifferent poem in twelve cantos; *Ancient Literature*, 1746; translations, etc.; and he also pub. a *Swiss Library* and *A Collection of Minnesingers.*

Bodmin, co. tn. of Cornwall, 30 m. W.N.W. of Plymouth. It has some trade in agric. produce, and has numerous relics, including Roman remains. Pop. (1901) 5353.

Bodo (Bodoë), a small coastal tn. of Norway. It is situated almost opposite the S. extremity of the Lofoden Isles. Pop. 253.

Bodoni, Giambattista (1740-1812), a celebrated It. printer, was the son of a printer of Saluzzo, in Piedmont. In 1758 he went to Rome and was employed as compositor in the printing office of the *Propaganda*. In 1788 he was made head of the ducal printing house in Parma, whence he sent out some beautiful eds. of Gr., Lat., Fr., and It. classics. The works from his press constitute the best examples known of It. typography, and are eagerly sought after by collectors.

Bödtcher, Ludwig Adolph (1793-1874), Danish poet, was born and educated at Copenhagen. For some time secretary to Thorwaldsen. He spent the middle period of his life in Italy, but died at his native town. His poetical output was small, being entirely comprised in two volumes, but he takes high rank among northern lyric poets. His poems are chiefly love-songs, but all are remarkable for perfect delicacy and finish; like a delicate-toned violin they express the most sensitive impressions of the artist. His philosophy was that of the epicurean and quietist. *See* Gosse's *Northern Studies*, 1879.

Body Cavity, a term used in embryology to denote that portion of the embryo which ultimately develops into the pleural, pericardial, and peritoneal cavities, that is to say, those portions bounded by the membranes enclosing the lungs, heart, and abdomen. The ovum after fertilisation divides up into a number of cells. A cavity called the segmentation cavity then appears; an outer layer of cells, the *ectoderm*, and an inner layer, the *endoderm*, are differentiated. Then there is established a linear streak called the *primitive streak*, consisting of thickened ectoderm. The *mesoderm*, or middle layer, then develops between ectoderm and endoderm. The mesoderm gradually extends over the whole of the ovum, separating the endoderm from the ectoderm, but in most mammals a cleavage appears in the mesoderm, which ultimately develops into the *cœlom*, or body cavity. In other forms the cœlum represents the segmentation cavity.

The embryonic area then develops, folds at head and tail, and attains a crescent formation, the endoderm being represented by the yolk-sac and primitive alimentary canal held between the horns of the crescent, and the body cavity forming the body of the crescent.

Body's Island, a sandbank off *N. Carolina, U.S.A.*, extending for some distance along the coast. It has a lighthouse 150 ft. high, the highest in the States.

Boece, Boeis, Boyce, or Boethius, Hector, celebrated for his *Scotorum Historia ab illius Gentis Origine*, trans. into the Scottish language for James V. by John Bellenden, and done into some 70,000 lines of verse by a doubtful William Stewart, was *b.* at Dundee about the year 1465. Descended from an anct. family who had held the barony of Panbride, near Carnoustie, since the reign of David II., B. received his education at Dundee, Aberdeen, and Paris University, where he took the B.D. degree. Vacating the chair of philosophy in the college of Montaigue, he was in 1500 appointed by Bishop Elphinstone to the first principalship and professorship of divinity of King's College, Aberdeen. Upon the death of that prelate B. wrote his life under the title *Episcoporum Murthlecensium et Aberdonensium*. In 1527 he received from the king a pension of £50 Scots yearly. Later, when he was appointed rector of Tyvie, that pension was altered for a yearly 100 merks Scots. This he enjoyed until his death about the year 1536, when he was buried beside Elphinstone. He had been made doctor of divinity (Aberdeen) in 1528. His famous history, introduced by a geographical description of the country, contains much that is fabulous and credulous. Its first edition of seventeen books was published at Paris in 1526.

Boeck [illegible] 1867), Ger. ph [illegible], was born at [illegible]t the university of Ha. under Wolf he logical bent. professor of philology at Heidelberg, and in 1811 he was transferred to the university of Berlin, where he occupied the chair of rhetoric and ancient literature. According to B. philology should be approached not only from the literary but also from the social and historical side, necessitating [illegible] entire life anct. wo: gave a gi classical numerou. particula of Pindar, [illegible] critical genius; *Die Staatshaushaltung der Athener: Metrologische Untersuchungen über Gewichte, Münzfusse, und Masse des Alterthums*, 1838. He also commenced the great *Corpus Inscriptionum Græcarum*.

Boehm, Sir Joseph Edgar (1834-90), sculptor, was born at Vienna, of Hungarian parentage. He early settled in England for the study of his art as a moulder of coins and medals, and his work was attended with such success that he was persuaded to devote his whole attention to sculpture. In 1869 he executed the colossal statue of Queen Victoria for Windsor Castle, and after that time a succession of noble patrons charged him with commissions. In 1878 he was made A.R.A., and in 1881 was nominated sculptor-in-ordinary to the queen. In 1882 he became R.A. The effigy of the queen on the jubilee coinage of 1887 was designed by him. He died at London.

Boehme, Jakob (1575-1624), a German mystical writer, was born near Görlitz in Upper Lusatia. His parents were poor, and he spent the early part of his life in looking after the cattle. He received practically no education, yet piety was so essentially part of his nature that he could not contemplate the sky without going into ecstasies of rapture. Later, it is true, he did receive some little education, but it was of the slightest kind. He was about the age of fourteen apprenticed to a shoemaker, and he remained in this trade for some very considerable time. He was never at any period in his life possessed of much wealth, and the greater part of his life was spent in one long struggle with poverty. His first written work was the *Aurora*, a work of revelation and meditation; of the nature of God and man. The book was eagerly read, and created a considerable sensation, so much so that he was forced to appear before the local council, who confiscated his book and told him to write no more. For the next six years he was silent, but at the end of that time he again began to write on such subjects as repentance and resignation. In 1624 he was summoned to Dresden, where he was well received, and where his works received high commendation from the court. He still, however, had to face clerical opposition, and both he and his chief opponent, Richter, died within a few months of one another. His main aim in the writing of his great work *Aurora* was to attempt to explain the origin of things. His language is always essentially mystical, and his meaning is often wrapped up in symbolic language too obscure to be easily understood or explained. His philo-

sophy can be largely called the philosophy of contradiction. The Ungrund, or Urgrund, was the source of everything—love and sorrow, heaven and hell, sweet and bitter, and his conception of God made the Deity the beginning and source of everything rather than the goal to which the [illegible] attain. [illegible] and a [illegible] as the [illegible] nd his [illegible] of the theologian. He was constantly attacked by the clergy, but he bore all attacks with considerable patience. His name is often quoted in England as Behmen, and during the 17th century his works were very extensively studied.

Boehmeria, or *Böhmeria nivea*, a species of Urticaceæ which is a native of China and Japan. It is valuable in commerce for its long and strong bast-fibres which are woven into the very durable material known as grass-cloth, rhea, or ramie.

Bœotia was one of the anct. political divs. of Greece; enclosed by mts., it had an area of about 1120 sq. m., extending between Locris and Phocis on the N., and Attica and Megara on the S. The earliest inhab. were the Minyæ, who were driven out by the Bœotians, who were of Æolian race and came from Thessaly. The prin. pursuits of the Bœotians were agric. in nature; as compared with other Gks. they were rough and boorish. This fact led to the term Bœotian being used as a synonym for ignorant, unlettered stupidity. The dist. was divided into five main divs.: the basin of Lake Copais, that of Asopus, the plain of Thebes, the coast dist. of the Eubœan Gulf, and that of the Corinthian Gulf. The prin. riv. was in anct. times known as the Cephissus; the subterranean outlets for it to the Eubœan Sea do not suffice, and after the spring rains the Copaic plain is almost under water. A Fr. company undertook the drainage of 60,000 ac. in 1886. Formerly the Bœotian League numbered fourteen great cities with Thebes at its head; now B., together with Attica, forms a province of the Greek kingdom.

Boerhaave, Hermann (1668-1738), the most celebrated physician of the 18th century, was born at Voorhout in the neighbourhood of Leyden. In 1682 he took his philosophical degree at Leyden, and in 1693 his doctor's degree. He was appointed lecturer on the theory of medicine at Leyden in 1701, professor of medicine and botany in 1709, and professor of chemistry in 1718. He had a great reputation in his time, and made a fortune of 2,000,000 florins by his profession. His works include *Institutiones Medicæ*, 1708; and *Aphorismi de Cognoscendis et Curandis Morbis*, 1709.

Boerne, Ludwig (1786-1837), Ger. writer and politician, born at Frankfort, of Jewish extraction; studied at Heidelberg and Giessen. In 1818 he was converted to Christianity and changed his name from Löb Baruch to Ludwig B. From 1818-22 he was editor of the *Wage*, described as a journal for civic life, science, and the Arts, and in 1819 issued *Die Zeitschwingen*. After the revolution of 1830 he settled in Paris, where he founded *Le Balance*. His political works, such as *Letters from Paris*, 1832, are marked by revolutionary patriotism, and his literary writings, notably *Jean Paul*, by beauty of style.

Boers (from Dutch *boer*, farmer, husbandman; *cf.* Eng. *boor*), name given to the Dutch settlers in S. Africa. They began their settlements in the 17th century, and they have been augmented by Fr. Huguenots. They particularly occupy the Transvaal and Orange River Colonies.

Boer Wars: 1. The war between the British and the Boers of the Transvaal, S. Africa, in 1880-1, occasioned by the proclamation of the Transvaal as a republic. The most notable event of the war was the defeat of the British at Majuba Hill in 1881. Peace was made shortly afterwards, Great Britain recognising the independence of the Transvaal. 2. The war between Great Britain on the one side and the Transvaal Republic and the Orange Free State on the other, in 1899-1902. The British at first suffered reverses, and British troops were hemmed in at Ladysmith, Kimberley, and Mafeking. All three were ultimately relieved, the length of the sieges being: Ladysmith, Oct. 29, 1899, to Feb. 28, 1900; Kimberley, Oct. 14, 1899, to Feb. 15, 1900; Mafeking, Oct. 15, 1899, to May 16, 1900. Pretoria, the cap. of the Transvaal, was occupied by the British troops under Lord Roberts on June 5, 1900. Peace was signed on May 31, 1902. The conquered countries were given self-gov., and in 1909 they were included in the Union of S. Africa by the S. African Union Act of that year.

Boethius, Anicus Manlius Torquatus Severinus (*c.* 470-*c.* 524), Rom. philosopher and statesman, born in Rome, of a distinguished family, he received a liberal education and soon became noted for his learning, especially in Gk. In 510 he became consul, and later chief of the senate. In 500 the seat of gov. of Theodoric, king of the Goths, had been fixed at Rome, and B., who had gained his confidence, was appointed 'magister officiorum' in his court. He lost the

favour of Theodoric, however, by his firm stand for the rights of the Romans against the tyrannical rule of Gothic officials, and in particular by his defence of Albinus and Symmachus, who had made an attempt to assert Roman independence. B. was accused of treason, degraded from his dignities, despoiled of his property, and after a long imprisonment at Pavia, executed by the king's command. While in captivity he produced his great work *De Consolatione Philosophiæ*, which takes the form of a dialogue between the writer and philosophy, the latter teaching the mutability of all things save virtue.

the religious tone of this work is decidedly theistic, it contains no reference to Christianity, which fact, together with the doubtful authenticity of
buted to
the medi
a Christian saint. This book was very popular in the Middle Ages, and was translated into Anglo-Saxon by Alfred the Great, and into Eng. by Chaucer. Boethius also translated the chief works of Aristotle, forming the main channel for the diffusion of the doctrines of that philosopher in the Middle Ages, and wrote manuals of arithmetic, astronomy, geometry, and music, which were largely used. His complete works have been several times published, the last edition being at Paris in 1860.

Boethius, Hector, *see* BOECE, HECTOR.

Bog, land which has become soft and spongy, from the presence of too much water. Generally it is partially composed of decomposing vegetable matter, and in this formation it is common in northern countries, and particularly in Ireland. Here the Bs. are sufficiently firm to bear considerable weight, and the heat of decomposition forms the vegetable matter into 'peat,' which is cut out and used both for fuel and in the composition of manures. It is estimated that over 2,000,000 ac. of the surface of Ireland is thus occupied. The greatest B. in the British Isles is the B. of Allen, lying to the E. of the Shannon, chiefly in co. Kildare, Ireland. The name is given to a collection of Bs., separate, but grouped together as the B. of Allen. The Bs., which may be from 20 to 40 ft. in thickness, often prove a serious menace to the prosperity of the surrounding land, for in the event of a 'B. burst' the neighbourhood may be swamped with water and covered with a deposit of peat. The surface of the Irish Bs. is covered with fine green turf, and the roots are so matted together that a man accustomed to the work may walk over them in safety. But the unwary venturer would be certain to take a false step and fall through, to be swallowed up almost instantly. The surfac
is usually
up into m
for drainage, of which advantage is now being taken. In England, Chat Moss, in Lancashire, is a B. which has been largely filled up, and Solway Moss should also be named.

Bog, River, *see* BUG, RIVER.

Bogardus, James (1800-74). Americ
inventor, was born at New York,
was brought up to the business of a watchmaker. He early began to devise mechanical improvements for clocks, and also for other purposes. He invented the dry gas-meter, a pyrometer, a sounding machine for use in deep seas, a dynamometer, etc. In 1839 the British gov. accepted his method for the manuf. of postage stamps. He died at New York.

Bog-asphodel, or *Narthecium ossifragum*, is a species of *Liliaceæ* growing abundantly on wet moors in Scotland and N. England. It has yellow flowers, a sympodial rhizome and loculicidal capsule.

Bogatzky, Karl Heinrich von (1690-1774), Ger. divine, studied theology at Jena and Halle (1715-18). As indifferent health hindered his preferment, he devoted some years to the foundation of an orphanage at Glaucha, in Silesia. After living for five years (1740-45) at the court of the Duke of Saxe-Coburg, he retired to an orphanage at Halle, and spent
s and books
portant of
Schatzkästlein
which has
been reissued over sixty times.

Bog-bean, Buck-bean, or *Menyanthes trifoliata*, is a common marsh-plant of Europe, Asia, and N. America, and is the single species of its genus. It belongs to the order Gentianaceæ, and its rhizome has tonic properties.

Bog Butter is a curious fatty substance which has been discovered in peat-bogs of Ireland and Scotland, and is known technically as *Butyrellite*. Its origin has been much disputed, some authorities considering it to be derived from vegetable substance, others proving by the finding of cow-hairs in it that it is of animal origin.

Hippolytus Theo-
ussian poet.
ittle Russia.
In 1788 he became president of the imperial archives. His fame as a

poet rests mainly upon his *Dushenka*, 1778, a mock-heroic poem based on the story of Psyche, and characterised by refinement of style and vivacity of language. Its publication brought him into great popularity, both with the court and the Russian reading classes generally, but the reputation of the work no doubt rests as much upon the novelty of its conception as upon its intrinsic merits, as it was the first work of its kind that had ever appeared in Russia.

Bogermann, Johann (1576-1633), a Dutch pastor, born at Oplewort, in Friesland; educated at Heidelberg and Geneva, and became pastor at Leeuwarden. He took an active part in several religious controversies, notably that with Arminius, and in 1618 was president of the Synod of Dort. He was largely responsible for the standard vernacular version of the Bible. The latter part of his life he was divinity professor at Franeker.

Bögh, Erik (1822-99), a Danish poet, author, and dra
Copenhagen. He was
having written more
plays, and is well known in his own country for his songs and witty sayings.

Boghaz Keui, vil. of Asia Minor, in the prov. of Anatolia and vilayet of Angora. The heights which overlook the vil. are crowned by the ruins of an anct. Persian city, generally identified with Pteria, which Crœsus destroyed after crossing the Halys (*see* HERODOTUS). Parts of the rocks are covered with sculptures, whose prin. scene shows the Persian king at a triumphal entry. It is composed of sixty figures, some of which are colossal. The rocks have been levelled by hand, though they naturally form a ring round the ruins.

Boghead Coal, or Torbanite, is a bituminous substance found near Bathgate in Scotland. It is dark brown in colour, and somewhat of the nature of cannel coal. It contains a large amount of volatile substance, consequently is largely used in making paraffin and gas.

Bogie, the name given to the framework supporting the front portion of a locomotive engine or railway carriage. The B. is pivoted to the frame of the engine, and has usually two pairs of wheels. By reason of the freedom of action given by the pivot, the strain and jolting caused when taking curves is greatly lessened, and the danger of the train leaving the rails reduced.

Bog Iron Ore is a mineral formed from depositions of limonite often found in bogs, lakes, and meadows In composition it may be compact or spongy, and in colour it is either blackish-brown or yellowish-brown. The iron which it yields is of good quality, but there is usually little of it, and it is often mixed with sand and clay. It is formed abundantly in the lakes of Norway and Sweden, in N. America, and in some parts of Scotland.

Bog Moss, or Peat Moss, is the name given to the various species of *Sphagnum* found in damp soil in northern lands. They are spongy, and readily absorb and retain water, both from the soil and from the atmosphere. The leaves are of a whitish colour, and the decaying roots aid in the formation of peat. *See* Dr. R. Braithwaite's *Sphagnaceæ or Peat Mosses of Europe and North America*, 1880.

Bog Myrtle, Sweet Gale, or *Myrica Gale*, is a plant which grows abundantly in bogs of Britain, especially in the Highlands of Scotland. The leaves emit a fragrant odour when crushed. It bears male and female catkins, and the fruit is a wax-
it.
watering-place in Sussex,
div. of Chichester. The
tn. is well equipped with the seaside requirements, and possesses a 16th-century church at Bersted. Pop. of urban district (1901) 6180.

Bogo, or Bago, a tn. on the N.E. coast of the Is. of Cebú, in the Philippine Is. There is a good harbour, and the surrounding country is fertile. Pop. about 15,000.

Bog Oak is a source of much profit to Ireland, where it is much used in the manufacture of well-known ornaments, such as miniature pigs. The wood is found in bogs, which indicates that forests once flourished in the present marshy ground, and it has become hard and black. The action of the antiseptic water preserves the oak well, but at the same time renders it difficult of manipulation in carving.

Bogodukhov, a tn. of Russia, gov. of Kharkov, 45 m. N.W. of Kharkov. Trade is principally in grain, cattle, and fish, but there are manufs. of leather, boots, etc. Pop. 11,500.

Bogomili (Slavonic, beloved of God), a religious sect which arose in the Gk. Church in Thrace, Bulgaria, and Macedonia, and was first mentioned at Philippopolis in 1115. Their leader was a monk named Basil, from whom Alexius Comnenus obtained a full knowledge of their doctrine and then condemned his informant to be burned in 1118, the followers who would not recant being thrown into prison. The sect still survived, however, until the Mohammedan conquest of the Balkan states in the 16th century. The B. held that God created Satanæl and Christ, the former of whom rebelled and created

earth and human kind, though God himself gave life to these new beings. Christ received from his mother Mary the semblance of man, and conquered Satanael, who became known as Satan. This sect upheld celibacy, forbade the eating of meat, and rejected images; baptism among them was purely spiritual, and the Real Presence in the Eucharist was denied: the O.T. was ignored but for the Psalms and Prophets, while the N.T. was received in its entirety. *See* Razki's *Bogomili i Paterani*, 1869; J. Heard's *Russian Church and Russian Dissent*, 1887.

Bogong, a mt. peak in Victoria, Australia. It has an alt. of 6508 ft. above sea-level.

Bogoroditsk, a tn. of Russia situated in the gov. of Toola, 40 m. to the S.E. of Toola. It has a trade in honey and flax, and a pop. of 7290.

Bogos, a pastoral tribe of Northern Abyssinia. Their country is largely cultivated, but in parts has almost impassable undergrowths, affording cover for wild animals. The language spoken is similar to Ago, and called by the natives Bilen. Christianity and Mohammedanism are the prevailing religions, and their laws are peculiar and stringent. The pop. is variously estimated, but exceeds 10,000.

Bogoslovsk, a Russian vil. of the Ural Mts. gov. It is situated 185 m. to the N.E. of Perm.

Bogota, originally Santa Fé de Bogota, is an American city, cap. of the prov. of Cundinamarca and the republic of Colombia, situated on a fertile plateau 8700 ft. above sea-level. It was founded by Gonzalo *Ximénes de Quesada*, a native of Santa Fé near Granada, in 1538, and became a bishopric in 1561, cap. of the viceroyalty of New Granada in 1598. After the Declaration of Independence it was taken by the Spaniards in 1816, recaptured by Bolivar in 1819, and became the seat of gov. of Colombia in 1831. The is traversed by the rivs. San Fran and San Augustin, and has re

[illegible] which the custom-house with other gov. buildings, and the beautiful cathedral: in the centre of the Plaza is a statue of Bolivar. As B. is subject to many earthquakes the houses are made of strong material; the town is noted for its numerous churches. It contains also a university, the Colegio Nacional de San Bartolomé, a museum, public library, observatory, and military academy. Within the dist. are valuable mines and good pasture-land, and the manufs. include soap, cloth, leather goods; the port is Honda, on the Magdalena. Pop. about 120,000.

Bog Plants have many difficulties with which to contend in their struggle for existence. The soil in which they grow often contains rich food materials, but is not sufficiently aerated, so that the plants cannot form nitrates; several of these plants, therefore, *e.g.* the sundew and butterwort, are carnivorous, and obtain their nitrogen from insects which they devour. Again, the water is deficient in lime and other salts, and the plants are stunted, unlike their neighbours in the marshes. Water-absorption is rendered difficult by the peaty acids of the bog, and many plants have therefore the characteristics of xerophytes. Agriculture will not tolerate the soil necessary for them, and the consequent drainage of the land usually kills the plants. Many of them are extremely beautiful, and for this reason they are grown under artificial conditions planted in gardens, in a soil composed of peaty substances and bog-mould, they receive a plentiful daily supply of water. Under their various head-

[illegible] examples: bladderwort, butterwort, bilberry, bog asphodel, bog bean, bog cinquefoil, bog orchid, bog myrtle, bog pimpernel, heather, ling, grass of Parnassus, meadowsweet, marsh-marigold, lousewort, rushes of different kinds with sedges and grasses, sundew, and yellow-rattle.

Bogra, a dist. of Bengal. It is situated in the valley of the R. Brahmaputra, and is placed partly within its delta. Its area is 1491 sq. m., and its cap. B. Pop. 689,467.

Bog-spavin is a term used in farriery for a tumour on the hock of a horse which arises from a distension of the joint-capsule and contains a [illegible] is seldom com-

[illegible] (1750-1825), a near Eye-educated at He became pastor of a Congregational Church at Gosport in 1777, which office he retained until his death, and in 1789 he superintended the dissenting theological college of this tn. In 1795 he founded the London Missionary Society, and later the British and Foreign Bible Society and the Religious Tract Society. His best pub. works are his *Essay on the Divine Authority of the N.T.* (1801) and, with Dr. James Bennett, a *History of Dissenters* (1809).

Boguslav, a Russian tn. 70 m.

S.S.E. of Kiev which trades in cloth and wool. Pop. about 12,000.

Bogutschütz, a vil. of the prov. of Silesia in Prussia.

Bohain, a tn. of France, in the dept. of Aisne. It is 12 m. by rail from St. Quentin which lies to the S.S.W. Its pop. is 5591.

Bohemia (Ger. *Böhmen*, Bohemian *Cheksy*) is a prov. and kingdom of Austria-Hungary. It lies between 48° 33′ and 51° 3′ N. lat., and between 12° 7′ and 16° 46′ E. long. It is bounded on the N.W. by the kingdom of Saxony, on the N.E. by the Prussian prov. of Silesia, on the S. by Upper Austria, and on the S.E. and S.W. respectively by Moravia and Bavaria. It has a length of 210 m., reckoned from E. to W., and a breadth from N. to S. of 170 m. Its area is 20,060 sq. m., and its pop. in 1900 was 6,318,280. The kingdom consists of a series of high-lying valleys surrounded by mts. The only riv. of much importance is the Elbe, which drains the whole country and flows through a single defile on the Saxon frontier. High mt. ranges surround the country; it is separated from Silesia on the N.E. by the Riesengibirge, Adlergebirge, and other range[illegible] Sudetic system; i[illegible] it from Saxony [illegible] the Bohmerwald, or Bohemian Forest, on the W. and S.W., the Moravian plateau on the S.E., joining the Bohmerwald at the south-western extremity, and the Adlergebirge at its north-eastern, complete the chain of enclosing mts. The Elbe leaves B. through a [illegible] birge and [illegible] Eger flow [illegible] which separates the Bohmerwald from the Erzgebirge. A series of terraces and plateaus slope down from the Bohmerwald in the direction of the Elbe; they are watered by the Moldau and its tributaries. The river valleys are the only level dists., at Prague, Pilsen, and Budweis, and they are not of great extent. The climate of Bohemia is similar to that of Germany; the low-lying river valleys naturally enjoy a more temperate climate than the mountainous dists. There are no very extensive lakes, but very many ponds. The country is noted for its mineral springs, of which the best known are the saline chalybeate springs of Franzensbad, Marienbad, and Giesshubel, the warm alkaline springs of Carlsbad and Teplitz, the bitter cathartic springs of Sedlitz, Sardschitz, and Pullna, and the sulphurous springs also found at Teplitz. Bohemia is largely composed of Azoic and Palæozoic rocks of great antiquity; there are also marine deposits of the Triassic and the Cretaceous age, whilst outflows of volcanic material are found. About a third of the surface is covered by forests, the remainder being tilled or used as pasturage. The soil is fertile, cereals being grown in the lower dists. of the N., and potatoes and oats in the higher-lying dists. Much sugar is manuf. from the beetroot which is grown. B. is very rich in minerals, producing one half of the mineral wealth of the whole empire. The minerals found include silver, iron, lead, copper, tin, antimony, uranium, and a small quantity of gold; in addition to these the most important, coal and lignite. The coal-mines, which lie principally around Kladno and Pilsen, have a yearly yield of over seven million tons. whilst the lignite mi[illegible] Aussig to Eger a[illegible] produce over [illegible] Iron ore is mined in the neighbourhood of Prague, Pilsen, and Falkenau, and smelted at the two former places; since 1878 the Gilchrist treatment has done much to improve the iron industry of the country. Sugar manufacturing is the industry of most importance that is carried on. The other manufs. include cotton goods from Reichenberg to Brux, and at Prague; cloth and woollen goods at Reichenberg, Aussig, Friedland, and Asch; linens at Schonberg, Trantenau, and Hohenelbe; carpets at Reichenberg and Eger; beer at Pilsen and Eger. Since the glass trade was introduced from Venice in the 13th century it has been a very considerable industry in B., the chief centres being Prague, Eger, Gablonz, and Karlsbad. Distilling and printing are also carried on to some extent. The trade of B. is a very active one, as the Elbe is exceedingly important as a means of communication and transit. The education of the country is on the whole good. Prague is the oldest of Ger. universities, being founded in 1348; it was divided into two separate universities in 1882, one for Ger. and one for Czech students. There are two commercial academies at Prague, a mining academy at Pribram, a forestry academy at Weiswasser, and agric. colleges at Taborand Böhmisch-Leipa, besides various other institutions of a technical character. The secondary schools are on the same lines as the Ger., whilst elementary education is compulsory from seven to fourteen years of age. The country is governed by an assembly numbering 242 members, and sends 130 members to the Austrian Reichsrath. About three-fifths of the pop. are Czechs, a Slavic race which has its own language and literature. The remainder is composed principally of

Germans, between whom and the Czechs there exists a feeling of bitter hatred. Speaking in a general sense, the Germans may be said to represent the cultured and more intelligent element of the pop., the bulk of the Czechs being peasants or dwellers in the small towns and villages. They nevertheless regard the country as theirs by right, and insist on the right of B. to occupy an autonomous position in the Austro-Hungarian monarchy analogous to that of Hungary. Over 95 per cent. of the pop. is Rom. Catholic, 1¼ per cent. being Jews. For administrative purposes the country is divided into ninety-four dists. and two autonomous municipalities.

History.—The name B. is derived from the Boii, a Celtic tribe which was in possession of the country at the earliest date of which we have any historical knowledge. The Marcomanni entered the country and vanquished the Boii shortly before the beginning of the Christian era; they held dominion until about the 5th century, when the Czechs entered the country, which they have since occupied. Nothing definite is known about B. from this period for a long time, the legendary [illegible] people as Krok and [illegible] foundation in fact, [illegible] introduced into th[illegible] 9th century by Cyr[illegible] but the annals of the kingdom have no interest until the 13th century. Wenceslaus I. was king from 1230 to 1253, and his son Premysl Ottokar II. waged war against the Prussians and Hungarians with great success. Rudolph of Hapsburg, elected Ger. emperor [illegible] ing caret[illegible] when Ott[illegible] II. succeeded him, being only seven years of age when his father's death took place; during his reign, which lasted till 1305, the kingdom enjoyed very great prosperity. His son Wenceslaus III. was assassinated at Olmutz after a reign of only one year; with him the male line of the Premysl dynasty terminated. Rudolph of Hapsburg and Henry of Carinthia reigned for a very short time, and no events of any importance occurred during their reigns. After these kings the Bohemians in 1310 chose John of Luxembourg for their ruler, the only son of the Ger. emperor Henry VII. King John was a strong member of the church militant, and was never happier than when engaged in some 'holy war' or other against the infidel. Whilst engaged in a crusade against the Lithuanians in 1336 he suffered the loss of one of his eyes, and complete loss of sight supervened in a short space of time. Notwithstanding his blindness he went to the aid of his brother-in-law, the King of France, against the English, and was killed in 1346 at the battle of Crecy. His zeal in war did not do any good to his kingdom as he spent all its revenues with no gain. His son Charles IV. was an admirer of the old Bohemian language, and a great patron of learning. He founded in 1348 the oldest European university, that of Prague. His Golden Bull, issued at the Diet of Metz of 1356, is remarkable for the fact that it recommends the Ger. princes to make a study of the Bohemian tongue. The daughter of Charles IV., Anne, was married to King Richard II. of England. On Charles' death in 1378 his son Wenceslaus IV. succeeded him. The doctrines of Wyclif penetrated to B. about this time, and were enthusiastically proclaimed by John Huss. Intermingled with these doctrines were the national aspirations of the Czechs, and as a result B. was the arena of internecine wars. Huss was burnt in 1415 at the council of Constance, but John Ziska became the leader of the Hussite party, and owing to his remarkable military genius the war was prolonged more [illegible] it would otherwise have been. [illegible] though blind, was a born leader [illegible] n and a talented general, being [illegible] ally skilled in fortification; he has, in fact, been termed the father of the modern art of fortification. Mt. Tabor was rendered impregnable by his skill. The moderate party of the Hussites, called Calixtones, because they insisted on the right of the laity, denied by the Catholic [illegible] priests, to retain the sacramental cup, [illegible] Ziska's death made terms with Catholics, and Sigismund, who had succeeded Wenceslaus IV. in 1419, was acknowledged king in 1433. Sigismund died in 1437 and was succeeded by Albert, Duke of Austria, who died in 1439 after a reign of only two years. During the minority of his posthumous son by Elizabeth, daughte[illegible] [illegible]e Podebrad wa[illegible]ceath in 1457 of [illegible] as this son was unanimously elected king in 1458 by the Bohemian estates. Podebrad was continually engaged in struggles against Matthias Corvinus the King of Hungary; on the former's death in 1471 he was succeeded by Wladislas, son of Cassimir, King of Poland. Wladislas also obtained the crown of Hungary, and in his reign the opposing religious parties were united by the peace of Kullenberg in 1485. He was a weak and inefficient ruler, and died in 1516. He negotiated two important marriages, however, that of the Arch-

duchess Mary, grand-daughter of the Emperor Maximilian, to his son Louis, and that of his daughter Anne to the Archduke Ferdinand, grandson of the emperor. The chief event of the reign of Louis is the invasion of Hungary by the Sultan Solyman, and the defeat of the Hungarians at the battle of Mohacz, which took place on Aug. 29, 1526, and in which Louis was killed. The Archduke Ferdinand was elected king after some controversy, and from this date B. really lost its nationality, as Ferdinand procured in 1547 that he should be nominated hereditary instead of elective ruler. Ferdinand crushed all attempts at recovering any of the liberty which he had taken away, and furthermore introduced the Jesuits into the country in 1556, a step which had reactionary results. The Emperor Maximilian II. succeeded him in 1564, and was succeeded after a reign of two years by his son Rudolph II. In 1609 the Bohemians compelled Rudolph to grant the noted Letter of Majesty which conferred the privilege of religious toleration on the country. This step did not, however, prevent the recurrence of the quarrels between Protestants and Catholics: Rudolph was compelled to abdicate in 1612 in favour of his younger brother Matthias; later, however, Rudolph succeeded in causing his cousin Ferdinand, afterwards emperor, to be elected as King of B. The Bohemian tongue was declared to be the official language of the country in 1615. Ferdinand, although openly tolerant of Protestanism, was a bigoted Roman Catholic, and had sworn to root out heresy in his dominions. The defenestration (Lat. *fenestre*, a window) took place in May 23, 1618. Slawata and Martinitz, two of Ferdinand's myrmidons, were flung out of the windows of the Hradschin by the Protestants. This event precipitated the Thirty Years' War (1618-48), the events of which belong to the history of Austria and Germany. By the end of the Thirty Years' War the political and religious liberties of B. were swept away, and the national language fell into desuetude. The Edict of Toleration, issued in the reign of Joseph II., restored the freedom of the different religions, and many who had been Protestants in secret declared themselves openly as a result of this edict. In the memorable year 1848, when Europe was everywhere disturbed by revolutionary movements, an attempt was made to assert the anct. independence of B. against the Austrian dominion. The insurrection, however, did not meet with success; the army gained the upper hand. Prague was bombarded, and the revolutionaries were finally forced to lay down their arms. The revival of the national spirit amongst the Czechs, however, which has taken place in the later 19th century, is undoubtedly deep-rooted and forms a constant menace to the permanency of the Austro-Hungarian realm. Of late years some of those in authority have shown a disposition to make various concessions to this spirit, but without over much success, as the feeling in the remainder of the Austro-Hungarian dominions does not seem to be in favour of it. In 1897 Count E. Trafe succeeded in persuading the representatives of B. to take part in the deliberations of the parliament of the empire at Vienna. The Bohemians consented on the condition that such a proceeding did not affect their opinion that B., Moravia, and Silesia should by rights constitute a separate state, under the same sovereignty as Austria and Hungary. Count Baden afterwards attempted to pass a bill making it necessary for every gov. official accepting employment in B. to have some knowledge of the Bohemian language. This attempt was, however, unsuccessful and was, in fact, responsible for the overthrow of the government then in power.

Language and literature. — The Bohemian language belongs to the Slavonic group, and was the first of that group to be scientifically cultured. It is spoken in B. and Moravia, and in a slightly modified form in Austrian Silesia, Slavonia, and a large part of Hungary. The Bohemian language, in common with the other Slavonic languages, has many declensions, tenses, and participles; in this respect they surpass modern languages, and are analogous to the old Greek and Latin tongues. The participles give the language much flexibility, allied with conciseness. The Bohemian has a great facility for forming new derivatives from native roots; by this means all the technical terms of theology, law, and philosophy have been formed and the language is able to cope with the demands on it of new sciences and inventions, without being forced to concoct hideous and cacophonous mixtures of dog Latin and worse Greek to describe anything new. The language has a great variety of diminutives, patronymic nouns also are used, and it contains the inceptive verbs. The conciseness of Bohemian is increased by the absence of auxiliary verbs, and by the fact that in the preterite tenses the termination expresses the sex of the verb's subject. It has a great variety of words for varying shades of meaning, and

possesses also the past participle active. The small connective particles, corresponding to the Gk. ἀλλὰ, μὲν, γὰρ, δὲ, etc., are also found in the Bohemian. It will thus be seen that the language has much expressiveness and energy. It is able to express the various emotions in a vigorous and lively manner, and since it is less fettered to particular constructions than any of the modern languages, the free and unrest
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translating the classics. The freedom of construction of the language renders it possible for any harsh sounds to be toned down, and generally it is very euphonious, having a
the Greek.
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s forty-two
letters. Language is undoubtedly a great influence in the development of national music; Bohemian is ranked next to It. in musical value, and the
e country,
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ıture may
be divided into three main periods—the first extends from the beginning up to the time of Huss, that is, to 1409; the second period extends from the time of Huss to about 1774; and from then till the present time forms the third period. The earliest genuine documents we have are sev. hymns and legends, and some epic fragments have been preserved. A version of a Lat. Alexandreis dates probably from about 1245, and versified lives of the saints have also been preserved. The *Chronicle*, in verse, which is generally called after Dalimil, though the real name of the author is not known, belongs to the 14th century. The Bohemians possess some remains of a collection of national songs, which probably date from 1290. They are not rhymed, and appear to have been of great merit, Goethe paying particular attention to them. The University of
by Charle
favour of
language, and commanded it to be learnt by the sons of the Ger. electors. All decrees were written in Bohemian instead of in Lat. in the reign of his son, the Emperor Wenceslaus. To this period belong the *Book of the Old Lord of Rosenberg*, one of the very early specimens of Bohemian prose, and the *Exposition of the Law*, by Andrew of Duba; Smil of Pardubitz, surnamed Ilaska, wrote some clever satires. Pribik Pulkava wrote another prose chronicle, and the *Tkadlcecek* (the weaver), which is thought by some to be based on a Ger. production, is written in praise of a certain Adelicka; the author of the latter work is not known. The Bohemian author of the 14th century who is pre-eminent among his contemporaries is Thomas of Stitny (1333-1400), who wrote in excellent prose upon religious and moral questions. Among other authors may be mentioned Warnier Z. Brezowa, who wrote a history of the Roman emperors, and translated *Mandeville's Travels*. By the end of this period, also, the complete translation of the Bible into Bohemian had been made. With Huss commenced the second period of the Bohemian language. The prevalence of religious disputes caused the Bible to be more widely read and better understood. Huss did much to settle Bohemian orthography, and his voluminous writings had great influence. Many of his works were in Latin, but a number in Bohemian. The church service was now read in Bohemian, the Bible was re-trans., and a great number of religious and controversial works written. One of the most influential figures of the time is Peter Chelcicky, who died in 1460. He was independent in his opinions, and advocated the entire submission of the religious man to temporal authority. He has been styled the Bohemian Tolstoi, and his writings had much influence in the formation of the Bohemian Brethren. His chief work is *The Net of Faith*. The first regular printing press was set up at Prague in the year 1487, and the years from 1500 to 1620 may be said
golden age of
During the
in B. and the
at this period,
artistic tend-
veloped them-
selves. In B. at this time the cultivation of learning was open to the whole people; all branches of science received attention, and were brought to a very high degree of knowledge for the time. The writers of the period are too numerous to receive detailed mention, but the names of 'Gelenius and Veleslavin,' 1546-99; Libocan, *d.* 1553; Bartos, *d.* 1539; Sikt of Ottendorf, 1500-83; Hajek, 1495-1553; Harant, Pisecky, and Wenceslaus Vratislav may be mentioned. But in 1620 the battle of the White Mt. rendered fruitless the Bohemians' efforts to preserve their language. The whole Bohemian nation submitted to the conqueror: no literature was produced in the country, and the decline was such that by the 18th century Bohemian as a written

language might be said to be almost extinct. John Amos Comenius, or Komensky, wrote over fifty works, dealing mostly with educational subjects; they were excellent works, and his projects for improving education attracted attention all over Europe. But they were written from exile, Comenius dying in Holland at the age of 78, in the year 1670. In the third period of Bohemian literature, dating from 1774, a revival has taken place. At that time a deputation of secret Bohemian Protestants induced the Emperor Joseph II. to grant religious toleration, and the Bohemian language at the same time began to flourish. The revival is still more marked since the middle of the 19th century. The poet Karl Hyneck Masha was the leader of the so-called romantic school, by means of which the Bohemian drama again began to flourish. Now most of Shakespeare's plays have been trans. into Bohemian. Among the many noteworthy figures in literature from 1774 to the present time the following may be briefly mentioned: Joseph Dobrovsky, 1753-1829, wrote a Czech grammar and a valuable work on Old Slavonic; Jungmann, 1773-1847, compiled a dictionary; and Kolar, 1793-1852, and Celakovsky, 1799-1852, were poets; Palacky, 1798-1876, was the author of the best national history, and other historians since his time are Tomek and Kalonsek. Bozena Nemcova, 1820-62, collected the folk-lore of the country, and Schafarik, 1795-1861, was the ethnographer of the Slavonic races. Karel Havliick may be called the founder of Bohemian journalism. The best-known present-day poets are Sladek, 1845; Zeyer, 1841; 'Eliska Krasnohorsa,' the *nom-de-plume* of Henrietta Pech, and Jan Vrchlicky, 1853.

Bohemia, Forest of, or Böhmerwald, is the mt.-range between Bohemia and Bavaria, stretching from the mouth of the Elbe to the Danube, about 120 m. in length. It is largely covered with dense, primeval forest, and towards Bavaria it is rugged and broken; the southern portion is known as the Bavarian Forest. The highest points are the Arber, 4780 ft., the Rachelberg, 4765 ft., and the Kubani, 4470 ft. It is traversed at various points by four roads, and by three mountain railways.

Bohemian Brethren, *see* MORAVIANS.

Bohemond I. (1056-1111), the eldest son of Robert Guiscard, distinguished himself in the war against the Emperor of Byzantium in 1081. He was excluded from the throne of Apulia by his brother Roger, and took a distinguished part in the crusade of 1092. After the capture of Antioch he estab. himself there as prince. He was, however, imprisoned by the Turks in 1100, but after three years' captivity returned to Europe and collected troops to renew the war against Alexius. He married a daughter of Philip of France.

Bohlen, Peter von (1796-1840), a well-known German orientalist, born in Oldenburg. He was educated at Halle and Bonn, where he devoted himself to the study of Oriental languages, attending the lectures of A. W. von Schlegel on Sanskrit at Bonn in 1823. In 1825 he was appointed extraordinary, and in 1830 ordinary, professor of Oriental languages at the university of Königsberg. His works include: *Ancient India*, 1830 (2 vols.), his most important work; *The Story of Genesis in the Light of Historical Criticism*, 1835; an edition of Bhartriharis' *Sententiæ;* and Kalidasa's *Ritusanhara;* an *Autobiography* published in the year following his death; and translations of Sanskrit poems in the original metre. B. possessed a most extensive knowledge of Eastern history and literature, and his works rank among the first of their class: their deficiencies arise mainly from two causes; first, the great haste with which he worked, and secondly, a want of sound philological knowledge, for which he had [illegible] in later years [illegible] impeded his antiquarian researches. B. was a contributor to the famous *Penny Cyclopædia.*

Böhme, or Bohm, Jakob, *see* BOEHME, JAKOB.

Böhmen, *see* BOHEMIA.

Bönmer (or **Boehmer**), **Eduard** (1827-1907), was a German philologist, born at Stettin. He became professor of philology in 1866 at Halle, and in 1872 at Strasburg. His publications include an edition of *Tractatus de Deo et Homine*, by Spinoza, 1852, the manuscript of which B. discovered, and an edition of the *Poem of Roland.*

Böhmerwald, *see* BOHEMIA, FOREST OF.

Böhmisch-Brod, a tn. in Bohemia, Austria-Hungary, 19½ m. E. of Prague. Pop. (1900) 4234.

Böhmisch-Leipa, a tn. of Austria in Bohemia with extensive manufs. Pop. about 9000.

Böhmisch-Trübau, a tn. of Austria in Bohemia, with a pop. of 6000.

Bohn, Henry John (1796-1884), a bookseller and publisher, was born in London, where his father, a Westphalian by birth, had a second-hand bookshop. Upon his father's refusal to admit him to partnership with him Bohn set up in business for himself, and in 1841 his *guinea catalogue* of rare books attracted much attention. In 1846 he originated his standard

library of reprints, and followed with a series of other libraries, until in 1853 he had issued over 600 vols. in cheap form. Many of the translations and compilations were his own work. He edited also Lowndes's *Bibliographer's Manual*, *The Origin and Progress of Printing*, 1857; and the *Biography and Bibliography of Shakespeare*, 1863. He died at his Twickenham mansion, which was noted for its collections of valuable books and pictures, at the age of eighty-eight.

Bohol, one of the Philippine Is. It is placed between Zebu and Leyte, and lies in lat. 10° N., long. 124° E. Its length is 40 m., and its pop. 120,000.

Bohrdt, Hans, a German painter (self-taught), born at Berlin, 1857. He travelled much by sea, to become familiar with the changing scenes of ocean. His pictures are largely marine-paintings (aquarelles and oil-paintings). He also painted a few official pictures of ceremonies, and of maritime events in which the Emperor William II. took part. He accompanied the latter on a voyage to Italy, 1896. In 1898 B. became professor at Berlin Academy of Painting. Among his works are: 'Reception of Emperor William II. at Spithead, Aug. 2, 1889;' 'The Meteor,' 1891; 'Brandenburg's First Seafight,' 1893; 'Opening of the North Sea Baltic Canal' (Berlin National Gallery); 'The Viking's last Voyage;' 'Sea-fight off Gothland in 1564,' 1901.

Böhtlingk, Otto (1815-1904), a Ger. Sanskrit scholar, studied Arabic, Persian, and Sanskrit at St. Petersburg (183[illegible] (1839-42). [illegible] comparativ [illegible] regularly p [illegible] especially s [illegible] *buch* (dictionary), which, with the help of two friends, took twenty-three years to complete.

Bohun, Family of, played a conspicuous part in Eng. history during the 13th and 14th centuries. Their founder was Humphrey, a companion of William the Conqueror, but Humphrey (III.), steward in the household of Henry I., was the first representative of note. Henry B. received the earldom of Hereford from John (1199). As their lands lay on the Welsh borders, the Bs. were notable Marcher barons. Humphrey (VII.) was among the nobles who obtained from Edward I. the Confirmatio Cartarum (1297). Humphrey (VIII.), a lord ordainer, fought for Edward II. [illegible] was taken exchanged f

Boiardo, or Bojardo, Matteo Maria, Count of Scandiano (*c.* 1430-94), It. poet, born at Scandiano in Modena, Italy, and educated at the University of Ferrara. His intimacy with Duke Ercole led to his appointment as governor of Modena in 1481 and of Reggio in 1487. His best work is the *Orlando Innamorato*, which Ariosto imitated and continued in his *Orlando Furioso*. He is famous also for translations of Herodotus, Apuleius, and Lucian, and his *Sonetti e Canzoni*; the dramatisation of Lucian's *Timon* is especially to be noted. The best edition of his works is by Panizzi, who issued them with his biography in nine volumes in 1830.

Boie, Heinrich Christian (1744-[illegible] [illegible]orn in [illegible] In [illegible] f the Göttingen poets. His own work was by no means exceptional, although thoroughly sound, and his importance is rather as editor, and founder in 1770 with F. W. Gotter, of the *Göttinger Musenalmanach*, and later, in 1776, as edito rof *Das Deutsche Museum*, which was a monthly magazine with a high literary standard.

Boieldieu, Adrien François (1775-1834), Fr. composer, born at Rouen. At an early age he manifested a talent for music, and at eighteen wrote a one-act play which was produced at Rouen. He studied music in Paris, and became later a professor at the Conservatoire de Musique. His friends included at this period such masters as Cherubini and Kreutzer. In 1803 he occupied the post of *maître de chapelle* to Emperor Alexander at St. Petersburg, but in 1810 returned to Paris to produce more operas. On his death he received a public funeral. His best works are the *Calife de Bagdad*, 1799; *Ma tante Aurore*, 1803; the music for Racine's *Athalie*, *Jean de Paris*, 1812; *La Dame Blanche*, 1825. *See* A. Pougin's *Boieldieu, sa vie, ses œuvres*, etc., 1875.

Boii, a powerful Celtic people inhabiting originally part of Transalpine Gaul. They early crossed the Alps, settling in the dists. between the Po and the Apennines and also between the Danube and the Tyrol, while some took up their abode in modern Bohemia, a country which received its name from this invasion. They are frequently mentioned in Cæsar, Livy, and Polybius.

Boil, an affection of the skin, consisting of a hard swelling containing dead tissue. It is the result of infection by the micro-organism *Staphylococcus pyogenes*, and is usually caused by general debility, some individuals being more liable to such manifestations of ill-health than others. It is necessary to expel the dead matter in the B. by clearing it out after a linear lancet incision. The

cavity should then be packed with antiseptic gauze, and hot boric fomentations applied. Small Bs. are often successfully dealt with by employing lead plaster or glycerine and Lelladonna. Reynolds' treatment consists of administering large doses of welldiluted sulphuric acid every four hours. In obstinate cases vaccine treatment may be resorted to, the vaccine being prepared from the patient's own staphylococci. The first injection should contain 200 millions, which should be followed by injections of one million each up to a total of 500 millions, the whole treatment occupying fourteen days. Spreading of the infection to adjacent follicles should be guarded against in removing pus. Of chief importance is the question of building up the system by careful attention to food and hygiene, and a good tonic should form part of any treatment.

Nicolas (1636-oct, the fifteenth parliamentary clerk, born in the Rue de Jérusalem, Paris. He was educated at the Collège de Beauvais, and studied first theology and then law at the Sorbonne. He was called to the bar in 1656, but was so disgusted at the insincerity and chicanery prevalent that he threw up his profession, and lived on the small fortune which his father, who died in 1657, had left him. He devoted himself henceforth to literary pursuits, but his first works hardly showed any promise of future talent. His earliest work of any note was his 'first satire,' which he pub. in 1660; eight others followed this, and still later he wrote four more, bringing the number up to twelve. In these works, which were modelled on Juvenal and Horace, he showed the capabilities of Fr. for expressive and at the same time regular verse. At the time of writing his satires he was living in an artistic coterie which included Racine, Chapelle, and Antoine Furetière, and it was no doubt in the intercourse which he had with them that he gained many ideas for his *Art Poétique*, which appeared in 1674. In this work he taught the value of artistic workmanship for its own sake, and reduced versification to rule; Pope was greatly influenced by it, and Eng. literature through Pope. In the same vol. as the *Art Poétique* were included the first four cantos of *Le Lutrin*, and the first four of his *Epistles*. *Le Lutrin*, which is one of his best known works, is a serio-comic epic; his epistles are characterised by a graver tone, as well as a more polished style, than his satires. He was appointed historiographer to the king in 1677, and from that time his literary products are fewer in number; five new epistles and the fifth and sixth cantos of *Le Lutrin* were pub. in 1683, but they are not equal in quality to his earlier work. The *Dialogue des héros de Roman*, which was published in 1713, and practically killed the vogue of romantic novels, had been written long previously. He was elected a member of the Academy, by the king's wish, in 1684; he made many enemies by his satires, and his death was probably hastened by the activity of the Jesuits against him. He was for a long time unduly decried, but now is assessed at possibly more than his proper value.

Boiler is the term applied to a vessel in which steam is generated for the purpose of driving a steam engine of some type. The essentials of a boiler are a closed vessel, holding the water and generated steam, fitted with means for supplying water and allowing the steam to escape. In addition there must be a furnace for supplying the heat, and appliances for determining the level of the water in the B. and the pressure of the steam. Further, there must be some system of safety valves for the automatic escape of any excess of steam pressure generated; while a chimney must be added at some place for the escape of the waste products of combustion, and for the formation of a draught to supply air for the working of the processes of combustion

Main types of boilers.—Bs. may be classified under two heads, according to the arrangement of the heating and water chambers. If the heating gases be carried through tubes surrounded by water spaces, then the Bs. are tubular; while if the steam and water be carried in tubes passing through the furnace gases, then the B. is of the tubulous type. In any type of B. there must be at least a flame chamber and a steam and water reservoir, placed adjacent to each other. The relative positions of these give rise to the two main divisions of Bs., as shown above. Any further development of the flame chamber leads to still further subdivision. The flame chamber must always consist of a furnace and an ashpan separated by a grate. These may be followed by a well-defined combustion chamber, or may lead straight to the flame passages or tubes, at the end of which will be a smoke box leading to the funnel or chimney. When the combustion chamber is not well-defined, a boiler of the locomotive or Lancashire type is obtained, while on the other hand, a well-defined combustion chamber in a tubular B. gives rise to the marine or Scotch boiler.

Efficiency of boilers.—The efficiency

of a B. is, in the first place, estimated by the percentage of the total quantity of heat which would be produced by perfect combustion, which is utilised in evaporating the water in the boiler. A great factor in this determination is the amount of coal which can be burnt, and this depends to a great extent upon the area of the grate and the air supply. Its value obviously is further determined by the length of the life of the B. and its freedom from breakdowns.

Grates.—The grates on which the coal is burnt are usually made of steel or wrought-iron bars, from ¾ in. to 1 in. wide on top, and from ½ in. to ⅝ in. apart. Care is taken with these bars to leave very little room between the sides of the furnace and the bars in order to prevent an inrush of air with a consequently high temperature at these points. These bars rest upon two crossbars at each end, while at the door end there is a broad plate, to the doors. A rate is a bridg the furnace ε ards to the flues.

Natural and forced draught. — Combustion of ces and tubes of air above. An excess or insufficiency of air leads to a lowering of the efficiency of the B. When a funnel is provided, the weight of the hot column of air measured above the grate is much less than that of a similar column of cold air outside. This causes a tendency to displacement which gives rise to a natural draught. In many cases, however, it is found necessary to force the draught in order to obtain a greater evaporative capacity from the Bs. and to obviate the loss of heat in the chimney or funnel, for under forced draught a very large proportion of the available heat in the gases, resulting from the burning of coal, is utilised before the funnel is reached. Many systems have been tried, among which may be mentioned those which were formed by placing steam jets above the furnace doors, allowing them to blow steam or air over the grate, and that of blowing steam or air through a closed ashpit. An adaptation of this latter system obtains in the Meldrum and Niclausse furnaces, and this system generally obtains now for all types of land Bs. It consists of two steam jets, fixed to the front of a closed ashpit, and projecting through this to a distance of about one-third of the length of the grate, with enlarged trumpet-shaped ends. The steam utilised in the jets is first passed through a superheater in the front of the furnace, and the fire-bars are placed very closely together, thus allowing for the use of coal dust and other inferior fuels. By raising a lever the plate at the front of the furnace can be raised to allow of a current of air above the grate. This causes the combustion of the smoke, so preventing the formation of smoke and causing a more complete combustion of the fuel to occur. The evaporative power of Bs. thus fitted has been proved to be much increased, and further, the action of the steam and air prevents the formation of clinkers, so improving the life of the bars. A further system is that founded by Howden. It is extensively used in ships of all nationalities, and consists of heated air being forced into closed ashpits, and simultaneously over the surface of the grate. Another system was applied by Thornycroft to torpedo boats, and consisted in closing the stoke-holds and forcing air into them by means of fans. It was applied to larger ships, but failed owing to the fact that it greatly increases the coal consumption in proportion to the extra power gained, and further to the fact that it caused furnace crowns to drop in and leaky tubes to appear. Fans in the funnel, or forcing air through the ashpit, may be further mentioned as other means of causing forced draught, which are employed in the mercantile marine.

Mechanical stoking. — Another method of obtaining the maximum power from Bs. is that of mechanical stoking, in order to gain a regular combustion of coal. A system which has been used by Messrs. Babcock and Wilcox and others is one in which a number of endless moving chains form the grate. The coal is spread evenly over the surface of the chains at the door, and is completely burnt on arrival at the bridge. Another form of mechanical stoker has been employed on the same type of B., and consists of a large hopper placed over a trough, fitted with a screw which recedes to the back of the furnace. As the coal falls into the trough it is crushed, and is then carried by the screw to the far end of the furnace. On its way it is completely burned. Proctor's mechanical stoker operates a shovel, and moves the bars of the grate, so acting to some extent in the same manner as a human stoker, only with precise regularity, and it further gives a constantly even layer of coal. Another mechanical system is that which utilises powdered coal. This is represented in England by the cyclone and Schwartzkopff systems. In the former system a closed furnace lined with fire-brick is employed. From a hopper the powdered coal drops into a worm and passes into a

fan from whence it is discharged with air into the furnace, where it burns, leaving a very fine white ash. In the latter system the powder is contained in a hopper with a loose side plate. Below this a hammer periodically strikes the plate, causing some of the powder to fall on to a revolving brush, which throws it into the furnace with a little air. This furnace, again, is made of fire-brick, and causes a white flame, with an ash mostly left in the flues. None of these systems is of very great use for marine Bs., in which type hand stoking still prevails.

Transmission of heat.—Heat is transmitted from the gases to the metal separating them from the water and from thence to the water. It is known that the gases transmit their heat to the metal much less readily than the metal does to the water, and it is known that the deposits from the water which cover the bottom plates of a B. are bad conductors of heat, which tend to lower the efficiency of the B. It is also agreed that to increase the heating surface (by the use of tubes) to more than 40-60 times the grate surface is useless. In tubulous Bs. of free circulation the first set of tubes in contact with the flame do 60 per cent. of the total evaporation performed by the B. If the surface of the plates be allowed to get dirty then the power of the B. is diminished. Since steam is a poor conductor of heat it is necessary to prevent steam bubbles from remaining on the sides of the B. In tubulous Bs. the circulation is fairly rapid. In tubular Bs. the circulation must be aided in one way or another.

Loss of heat.—To prevent the loss of heat from the surface of Bs. by radiation, they are covered with some non-conducting substance. The lagging employed may be a coating of felt about 1 in. to 2 in. thick. This lagging has been found by tests to be the best, although it suffers under the disadvantage of being combustible at high temperatures. Other laggings employed are asbestos, silicate cotton, and magnesia blocks. The smoke box is lagged by means of baffles and a coating of some one of these non-conductors, while the funnel of steamers is insulated by means of an air casing round the funnel proper. Tubulous Bs., as will be seen from their description later on, need this lagging even more than do tubular Bs., for the casing in many cases is directly a portion of the furnace walls. In these cases the non-conductor is brickwork covered with ashes between plates.

Wearing and corrosion.—In marine Bs. one of the chief causes of wear is the introduction into the B. of sea water. This has magnesium chloride in it, and under the influences of heat and water it yields magnesia and hydrochloric acids. These act corrosively on the B., and to prevent this, lime is sometimes used. Again, when vegetable oils and grease are used on the engines some proportion finds its way to the Bs., and the fatty acids cause great corrosion. Carbonate of soda is sometimes used to neutralise this, but it has a bad effect of its own, so lime has to be relied on. Again, Bs. are fitted with a surface blow off, in order that the greasy substances floating on the water may be removed, for if allowed to settle they form a coating which is a very poor conductor of heat, thus causing plates to become overheated, and the consequent collapsing of fire boxes. To prevent corrosion zinc plates are hung in the Bs. by means of copper strips. This zinc combines with the acids in the wa[illegible]. It also act[illegible] he iron in an[illegible] reducing its[illegible] Mineral oils as now used for lubrication, also have violent corrosive effects, and to the use of zinc plates, a frequent use of the surface blow off is necessary. Even then deposits of these greasy substances occur, and it is therefore necessary to wash Bs. out sometimes with caustic soda, to free the B. from these impurities.

Production of heat in boilers.—As has been seen, forced daught, mechanical stoking, and an increase in the heating surface, all lead to a more economical use of the heating effects of fires, and consequently tend to raise the efficiency of Bs. Theoretically just over 11 lbs. of air are needed to burn completely 1 lb. of average coal; but practically it has been found that about twice as much air is needed either with forced or natural draught. In tubular Bs. it is found that about 25 to 30 per cent. of the heat generated is lost in the funnel, and by an excess of air which cools the gases down. In tubulous Bs. the loss of heat is about 20 to 25 per cent. Careful stoking also adds to the efficiency of a B. In tubular Bs. a concave fire is probably the best, as it gives the greatest heat, where the water is nearest to the flames, while with natural or forced draught the thinner the fire the greater the chance of perfect combustion. The ideal either with natural or forced daught is a mean thickness of fire of from 4 to 6 in. Thus small charges frequently added are the best means of stoking. With natural draught the fire should never be thicker than 8 in., while with forced draught it may vary from 10 to 15 in., according to the draught. Fires of this thickness lighten the stokers'

work, but do not tend to a perfect combustion of the coal or an ideal efficiency of the B. Soot in the tubes acts as a poor conductor of heat, and lessens the B.'s efficiency, and this again is an added reason for careful stoking, and it further leads to the fact that these tubes need constant cleaning.

Priming.—A cause of variations in the steam pressure (and a result of these variations) is priming—bubbles of steam uniting at the surface and passing over with the steam into the cylinders as a sort of emulsion. If a stop valve be opened too suddenly, a lowering of the pressure in the B. takes place, and the steam being formed more rapidly, causes these bubbles to rise violently, giving rise to priming. It is prevented by the use of anti-priming pipes, and by taking off the steam at a point as far removed as possible from the water surface. A large steam space and a high pressure prevent priming. A layer of mineral oil used to be placed on the surface of the B. water, as it was found to prevent priming, but it does not float long, but settles as a deposit on the bottom, as a non-conducting deposit capable of doing great damage.

Feed-water heaters and economisers.—In order to increase the efficiency of a B. it will be seen that it is advantageous to heat the water before it reaches the B. This is done in several ways. On tubulous Bs. they are generally an integral part of the B. Other forms are those where the economiser utilises the waste gases in the flue; a series of pipes being placed at the base of the chimney so that the escaping gases pass round the feed water; while in another system the exhaust steam is used to heat the feed water.

Superheaters and separators.—To transform the wet steam formed into dry steam necessitates the use of one or other of these two means. A separator is usually employed with tubulous Bs., and consists of a vertical cylinder with a centre baffle which causes the steam to strike against the sides and deposit the water at the bottom from whence it is drained by a drain cock usually worked automatically. Superheaters act by drying the steam with extra heat, and are th ployed on tubulous Bs., and some- an s at the base of the funnel on now e Bs. As steam is a bad consists of heat large heating surfaces front o e used and the consequence ing throu not used one-t hough on with ht are not The they are passed throug loyed. front of the fur —In tubular Bs. it is necessary to have about 8 in. of water above the top of the combustion chamber. Gauge glasses are fitted to the Bs. of all types, so that the level can be read, for it is evident that in any B. the amount of water present is of vital importance. In order that no accident can happen which will render the level unknowable, it is usual to have two gauge glasses. Further, all Bs. are fitted with (usually) two safety valves. These valves are set to the pressure which the B. is intended to, and can safely, carry. They are locked up in such a manner that while the weight on them can be eased, so that they may allow the steam to blow off at a lower pressure than the designed one, yet it is impossible to screw them up to blow off at a higher pressure. This, of course, is a saf ing and reckl designed in su are capable of pressure at a very quick rate; so that it is almost impossible for the pressure in a B. to get much above the designed pressure, however quickly the steam may be accumulating. Further there must be an injector or a feed pump for filling the B. with water, and supplying it with reserves to take the place of losses. Sometimes the ally, but to have a whose r in the boilers is kept within safe limits.

Cylindrical land boilers.—For land purposes a very common form of B. is that known as the Cornish, with its three variants, the Lancashire, Galloway, and Economic Bs. The Cornish B. consists of a long horizontal cylinder with flat ends, having a long tube stretching from end to end within it. The outer ring contains the water, and at one end of the inner tube a furnace is fixed. The other end is connected with the chimney. Cross tubes run through the inner tube connecting the water above and below the furnace tube, so increasing the heating surface and facilitating the circulation of the water in the B. A Lancashire B. is similar to this except that it has two large tubes running through the outer shell; thus it has a bigger generating power since it possesses two furnaces. They can carry a large steam pressure and can hold a good supply of steam. They are used in those cases where a heavy reserve of steam is required. The Galloway B. is an improvement on the Lancashire B. In this the two furnace tubes are merged behind the fires into one long kidney-shaped tube. Across this flue tube are set a large number of conical tubes which serve

as in the Lancashire B. for heating surface increase and for circulatory purposes. This B. has a much greater evaporative efficiency than the ordinary Lancashire. They take up rather a lot of ground, being long and horizontal, a common size being 30 ft. long, by 8 ft. diameter; but because of their great power and reserve, which enables them to keep steam easily once it is obtained, and because of the ease with which the heating surfaces can be reached for cleaning purposes, they are in great demand. The Cornish, of course, can only give a moderate quantity of steam. The Economic B. occupies much less space than the other types, being just about half as long in proportion to its diameter. It is fitted with small tubes which run from end to end of the B.

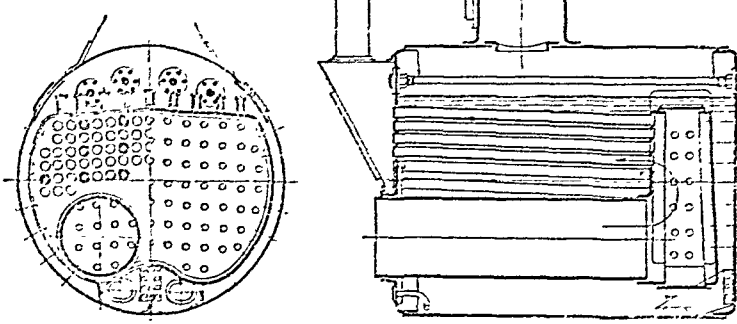


FIG. 1.—MARINE BOILER

above the furnace tubes. At the back a combustion chamber, lined with fire-brick, takes the products of combustion, which then return through the tubes above to the smoke box in front of the B. above the furnaces, and so to the chimney. Since it has a large heating surface it tends to the economic uses of the fuel, and at the same time it can be almost as easily examined as the other types mentioned above. It is therefore to be preferred where the space available is not too great. Further the stoking is not so hard on these as on the others, although with forced draught any of them will stoke rather easily.

Egg-ended boilers.—All the Bs. mentioned above are internally fired. The furnaces are surrounded by the water to be heated, and are inside the shell of the B. Before these types of Bs. were introduced, an externally fired B. was used. It was composed of a long cylindrical B. having hemispherical ends, which was heated by means of a furnace placed under the B. This type of B. must not be confused with the tubulous B., which is also heated externally, but as will be shown, has water tubes passing through the heating space. It is not an economic or efficient type of B., and has largely gone out of use, although it is used in places where fuel of poor quality can easily be obtained.

Marine boilers.—The Bs. of this name are cylindrical return tube Bs., and they are sometimes called Scotch Bs. Before these Bs. were introduced, rectangular Bs. on the same principle were used. They would only stand pressures up to 17 lbs. per sq. in. while cylindrical Bs. started with pressures of 55 lbs., which now have risen to beyond 200, and in tubulous Bs. to beyond 300. The rectangular form required staying in three directions, but the cylindrical only in one, and further, the cylindrical is by far the best form for withstanding pressures, although the rectangular would have suited the form of the stokehold best. Some marine Bs. were made of two half cylinders joined at the sides by flat plates, so making their height greater than their breadth. It was known as the elliptical type, but it has gone out of use now. In marine tubular or Scotch Bs. the furnaces, combustion chamber, and tubes leading to the smoke box are surrounded by water. As will be seen from Fig. 1, the hot gases pass from the furnace to the combustion chamber, and thence through the tubes above the furnace tube to the smoke box which is outside the B. There may be from one to four furnaces in this type B., but when there are more than two they are placed on different levels. The furnace tubes are cylindrical and may vary in dia-

meter from 2 ft. 6 in. to 3 ft. 6 in. If the number of furnaces be increased and the diameter decreased, then a greater quantity of coal can be consumed, since the grate area will be greater. On the other hand, it is found that the larger the diameter and the less the number of furnaces, the more perfect is the combustion, and the greater the production of steam. But in practice the size of the furnace tubes is limited by the fact that the liability to collapse gets greater the larger the diameter of the tube gets. The smaller the diameter of the tube the greater the strength. The combustion chamber at the back is usually made equal to half the diameter of the furnace tubes plus 12 in.

naces, since is reversed, and a consequent intimate mixing of the combustible gases and air takes place. If combustion were

space over two single ended Bs. placed end to end of 1 foot, and the thickness of two water spaces behind the combustion chambers and at least 3 ft. which would have to be left between the two Bs. It was found that on applying forced draught to this type, however, that leaky tubes resulted, so a combustion chamber was provided for each end. On some liners again, a combustion chamber is provided for the two corresponding furnaces at opposite ends.

Direct t

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furnace, at the same height, but on the opposite side of the combustion chamber. This type of B. is valuable on gunboats, where there would not be room for return tube Bs. under the armoured deck. Since the diameter of the shell is less, then the pressure

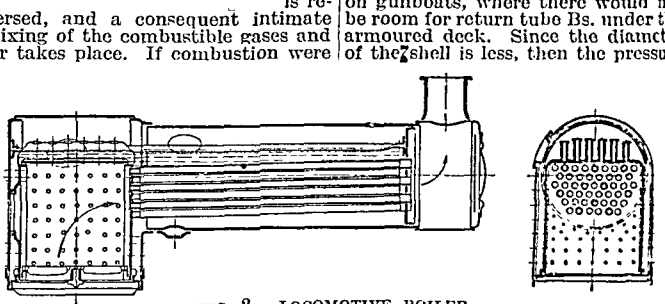


FIG. 2.—LOCOMOTIVE BOILER

perfect, as it never is, then there would be no smoke nor flames in the funnel. Sometimes the combustion chamber is common to all the furnaces, with, of necessity, all the tubes starting from it. In other types there is a combustion chamber for each furnace, with water spaces between. These spaces increase the heating surfaces, and keep the flames proportionately divided. In the mercantile marine the combustion chamber is usually common to all the furnaces, while in the navy the combustion chamber is usually subdivided; because forced draught with one combustion chamber would cause unequal heating of the tubes. Sometimes these Bs. are fired from each end, and are known as double-ended Bs. It is on merchant ships that they are of greatest use. They then have a combustion chamber common to both ends. This type does away with the water space at the back of the combustion chamber, which gives trouble continually on account of the stays. The combustion chamber is usually made 1 foot greater than the diameter of the furnace. This leads to a saving in can be greatly increased, and further, the tubes can be made longer or shorter than the length of the furnace tubes. Several disadvantages, however, follow from the use of this type B., and it is falling into disuse. The furnace crowns and the top of the combustion chamber are liable to overheating, because they are so near the water level. Further, it is liable to unequal expansion, and only gives a feeble circulation of the water. It is called the Admiralty B. because at one time it was largely used in the navy.

Locomotive boilers.—These are distinguished by the arrangement of their furnaces. The sides and crown of this type of B. are flat (Fig. 2), and the fire-box is open to the air, so that the draught varies with the speed of the train. The furnace plates are all made of steel, although the back or tube plate used to be made of copper. Around the furnace the sides of the B. are flat, and the sides of the furnace and the B. are stayed to each other, while the top of the B. is semicircular, with the flat or nearly flat furnace crown suspended from it by stays. From the furnace to the front part of

the B. extends a cylindrical shell called the barrel, along which stretch very long, narrow tubes from the back plate of the furnace to the smoke-box. These tubes act as stays for the tube plate of the furnace and the end plate of the boiler. The fire-box being high acts as a combustion chamber. These Bs., of course, were invented to suit the purposes of the locomotive, but owing to the fact that they take up little head room, and are capable of forcing, and that they are proportionately light when compared with cylindrical return tube Bs., they were used in the navies of various countries with certain modifications. They are also sometimes used for stationary engines. To add to the draught the exhaust steam is led into the funnel (when it is not condensed). The marine type of locomotive B. has the grate much higher up than in the railway type because of the head room. This, of course, reduces the size of the combustion chamber, while the length of the B. must be less than that of locomotives, thus giving shorter tubes. For various reasons this type of B. has given place at sea to tubulous Bs., which are beginning further to oust the cylindrical Bs. on larger vessels. A railway B. is in use for five or six hours, and is then thoroughly overhauled and cleaned, while the opening of the furnace doors does not mean a sudden inrush of cold air which is the case with marine Bs., where the pressure inside is less than that outside the furnace. Again, a locomotive runs smoothly, and the danger of exposure of the furnace crown, without water, to heat is greater with the flat crowns of locomotive Bs. than with the circular crowns of cylindrical Bs. As a railway engine B. it stands supreme, because of its capability to regulate its draught to its speed, and because, owing to the large area of heating surface surrounded by small water spaces, it is able to generate and keep steam easily and in great volume.

Tubulous boilers.—This is an entirely different type of B. from the tubular, and the chief point of difference is that whereas in the tubular B. the heating gases were surrounded by water, in the tubulous B. the heating gases surround the water. Whereas in the tubular the tubes were subject to compression, they are in the tubulous subject to tensile strain or expansion. On land one type or another of tubulous B. is now generally used where high pressures are required, and where there is a continuous round of stokers not necessitating any heavy reserve of steam. They are employed at sea on torpedo boats and destroyers, and are being used on cruisers and battleships, although the liability of the thin tubes to corrosion, rendering their life uncertain, has precluded their extensive use in the mercantile marine. As has been mentioned previously, the smaller the diameter of a tube the greater is its power to resist bursting. Therefore, since *tubulous Bs. are composed of small* tubes, they are sometimes known as safety Bs.' Added to the fact of the smallness of the tubes the danger of bursting is limited to single tubes, and further, only a small quantity of water is contained in them in proportion to that in the tubular B. Tubulous Bs. are easy to clean and repair, and the component parts being small, they are portable and allow of the fixing of the Bs. in small buildings with ordinary openings.

Belleville boiler.—This B. is extensively used in the various navies, and is one of the type with 'limited circulation.' It consists of a number of elements, each containing two parallel rows of tubes, inclined two or three degrees from the horizontal. Those of one row incline in the opposite way to those in the other row, and are connected with them at each end by junction caps, thus forming a flattened spiral. In a large B. there would be from ten to twelve of these elements. The water level is about halfway up these tubes. At the top of these is a steam reservoir, while the water is supplied to the bottom pipe of each element. The circulation of the water is caused by the difference in the density of the water flowing in at the bottom, and the density of the mixture of steam and water at the top of the tubes. Before the water enters the lower spiral of pipes it has to pass through a smaller spiral at the top of the B. proper, which acts as an economiser, heating the water before it is introduced to the B. proper. The water passes from the economiser into the steam drum, and any steam present is separated out. It then passes down a pipe to the feed collector, with a settling drum for collecting impurities, into the bottom spiral and back to the steam drum. The furnace is under the lower set of pipes, and the heating gases pass up between the spirals of both the B. proper and the economiser. It has only a small combustion space, and therefore needs air compressors, and since automatic feed regulators are used on them, they require a more or less skilled staff. A Boiler Commission, appointed by the Admiralty in 1901, reported unfavourably on them at a

time when the French navy described them as the most reliable. They can certainly be repaired easily, and the dangers of an explosion are not so great as with tubular Bs., while on the other hand, the dangers from pitting of the thin tubes are always present.

Babcock and Wilcox boiler.—This is one of the type of tubulous Bs. known as 'free circulation' B. With the Bs. with 'limited circulation' steam is apt to collect in lower rows of tubes through insufficient circulation, and priming sometimes occurs through the absence of a steam chamber. To obviate this, Bs. with inclined tubes for generating steam, connecting two vertical water spaces, under a test pressure of 150 lbs. except in rare cases. The mud drum is of cast iron. The whole is suspended on iron girders resting on iron columns, and the whole of the sides are encased in brickwork. The fires are built under the front higher end of the tubes, and the heating gases pass between the tubes into a combustion chamber under the steam and water drum. From there they are caused by brickwork baffles to pass down again between the tubes, as shown, and again up through them, and thence to the chimney. The water in the tubes tends to rise as it is heated and converted into steam into the top end of the tubes, and thence through the front vertical space into

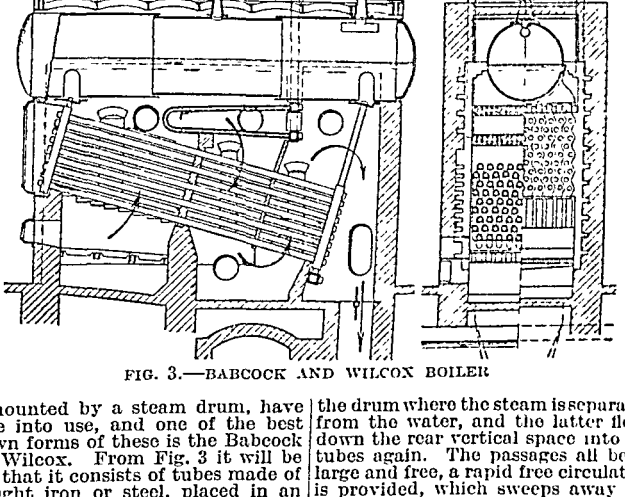


FIG. 3.—BABCOCK AND WILCOX BOILER

surmounted by a steam drum, have come into use, and one of the best known forms of these is the Babcock and Wilcox. From Fig. 3 it will be seen that it consists of tubes made of wrought iron or steel, placed in an inclined position and connected with a horizontal steam and water drum by means of vertical passages at each end, with a mud drum at the lowest rear point of the tubes. Each vertical row of tubes joins on to one piece at each end, and the inclined tubes are 'staggered,' or placed in such a position that each horizontal row comes over the spaces in the row beneath. There are openings opposite the end of each tube covered by hand hole plates, for cleaning purposes, and are made to stand pressures of 300 lbs. per square inch at the joints. The drums are made of flange iron or steel, and are designed for all pressures, though none are made the drum where the steam is separated from the water, and the latter flows down the rear vertical space into the tubes again. The passages all being large and free, a rapid free circulation is provided, which sweeps away the steam as fast as it is formed, and at the same time replaces it by water. This causes a rapid mixing of the water in the B., so maintaining an even temperature throughout with a further sweeping away of a large proportion of the deposits otherwise likely to encrust the tubes. In the diagram accompanying, a superheater, consisting of steel tubes bent into a U-shape, connected with boxes, is shown under the steam drum. The upper box receives the steam from the B., and the lower one returns the superheated steam, after passing through the tubes to a valve above the B. The advantages of superheating the steam are that it has a

higher temperature than the water from which it is evaporated, so that water cannot exist in its presence. The result is that the loss due to condensation in pipes and cylinders of the engines is lessened. For naval

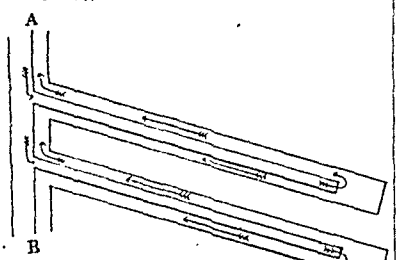


FIG. 4.

purposes the tubes are replaced by boxes of from four to six inches in diameter, inclined in the opposite direction, with the B. across the front instead of reaching back. In the mercantile type the tubes are from three to four inches in diameter, with oval hand plates for cleaning. The shown, possess the common advantage of tubulous Bs. over tubular of being less liable to dangerous explosions. Further, since the water level is in the steam drum above the tubes, they are not so liable to overheating of the tubes as are those tubulous Bs. of limited circulation, typified by the Belleville, which has no large steam drum, and in which the water level is not accurately known. It possesses further the advantages that the construction and circulation is simple, and the tubes are straight and jointed by expansion —not screwing. They are, therefore, easily replaced, inspected, or repaired. The grate area is large, and ample space is allowed for combustion. The inclined position of the tubes is for the purpose of getting the flames at right angles as near as possible to the heating surface, so obtaining the maximum heat from them.

Niclausse boiler.—This B. may be said to be a variation of the Babcock and Wilcox, and all allied forms such as the Simonis-Lanz and Steinmuller, in that it only has one vertical header, or water space, and that at the front of the tubes. It consists, as do all

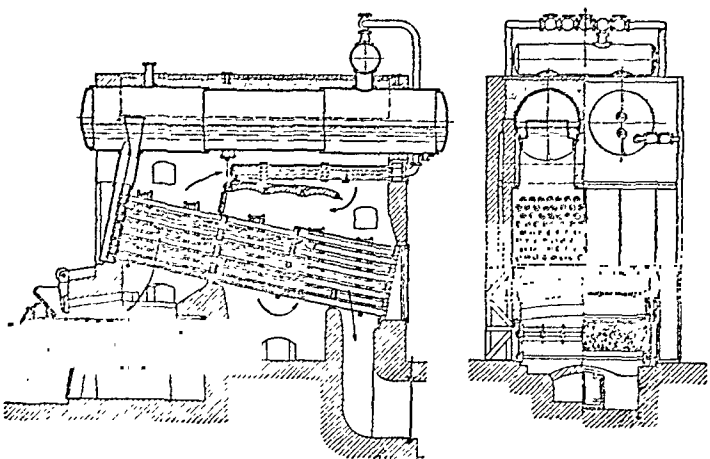


FIG. 5.—DURR BOILER

extra size in the tubes saves weight, and through their greater capacity ensure a cool casing. Being slightly thicker than the smaller tubes they can withstand wear and tear which may ensue from the pic-tools, and they are also better adapted for preventing the adherence of clinkers. They are considerably lighter than cylindrical Bs., and, as has been these variations of the two water-space, free-circulation boilers, of a series of inclined compound tubes, joined up to the front vertical header, and closed at the far end. In order to gain circulation the header is divided, as is simply illustrated in Fig. 4, by a vertical diaphragm, AB. The inclined tubes are double, and the inner tube connects up with the outer

portion of the header, while the outer tube connects with the inner portion of it. Thus circulation is maintained by the water passing from the B. down the front compartment of the header through the inner tubes, whence the steam water generated passes through the outer tubes and back through the rear compartment of the header to the steam and water drum. When superheaters are applied to this class of B., it is placed in the centre of the nest of tubes, about halfway up, and not directly under the steam drum.

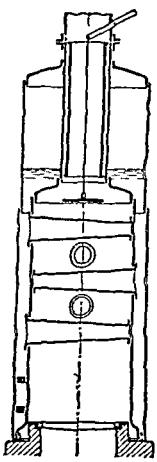


FIG. 6.—VERTICAL BOILER

Durr boiler.—The Durr B. (Fig. 5) is similar to the Niclausse in that it has only one header, but this header is used for all the tubes, whereas the Niclausse headers are divided into separate elements for each vertical row of tubes. Both the Niclausse and Durr Bs. are largely used in the various navies. The Durr B. can be entirely dismounted from the front, and the tubes are slightly bent, so that they almost touch each other, forming almost a tube wall.

Stirling boiler.—The above are types of Bs. with free or limited circulation. We now pass on to a consideration of tubulous Bs. with accelerated circulation. This type of B. is important in some kinds of work, such as, for example, naval work, for they allow of higher rates of forcing than do those with free or accelerated circulation, although the makers of free circulation Bs. are by their [illegible] gaining a deal [illegible] *ith accelerated* [illegible] t of steam and water circulates more rapidly than does the steam in a Belleville, or than the steam and water in a B. with free circulation. The steam bubbles are carried away as fast as they form, and cannot accumulate, forming steam chambers, however great the evaporation is. This is done by letting the steam and water circulate through high columns and by placing the tubes carrying the water from the steam and water drum to the bottom reservoir in such a manner that a direct circuit is obtained, with the tubes carrying the steam back to the drum at the top. One form of this type of B. is the Stirling B., which is chosen because it is used both on land and at sea. It consists of two or more drums at the top, joined together by short horizontal tubes. These top drums are connected to bottom drums by means of long tubes inclined slightly to the vertical, and bent at their ends to join radially to the drums. The feed water first passes into the back top drum, so that the back row of tubes really forms a feed heater, and sediment and scale is either deposited in them or in the back half of the bottom drum, because of a perforated baffle which is placed in the centre of it. So it passes through the tubes and drums gradually to the front bank of tubes in which most of the steam generating is done, and done well, because of the removal of impurities. The steam generated passes from the top front drum by means of the horizontal tubes to the back drum again, separating from the water on the way. The circulation of the heating gases is across and up and down the heating tubes, and the large combustion chamber secures better combustion than with other types, which have the tubes close over the grate. To facilitate the removal of any one tube in repairing without removing others, one tube is left out in the centre of each bank of tubes.

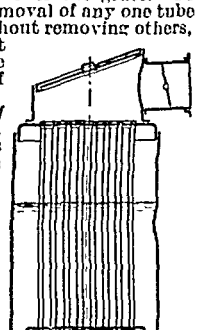


FIG. 7.—VERTICAL BOILER

Advantages of tubulous boilers.—The reasons for the gradual extension of the use of tubulous boilers may be summed up as follows. They are capable of standing very high pressures owing to the fact that they are composed of cylindrical elements of very small diameter, and the smaller the diameter the greater the strength to resist bursting. On some tubulous Bs. pressures of 440 lbs. have been used; and the only limiting power seems to be that of the temperature [illegible] itself to the engines. [illegible] are coning power, so that higher pressures can be safely looked forward to as being applicable

to engine power. Now cylindrical tubular Bs. have a maximum power which depends upon the thickness of the shell plates, and difficulties in the construction of the furnaces. Again, since tubulous Bs. can support higher pressures, and since the volume of steam and water contained in them is small, they are less liable to cause serious accidents of a large nature than tubular Bs. The results from the explosion of a tubulous B. are

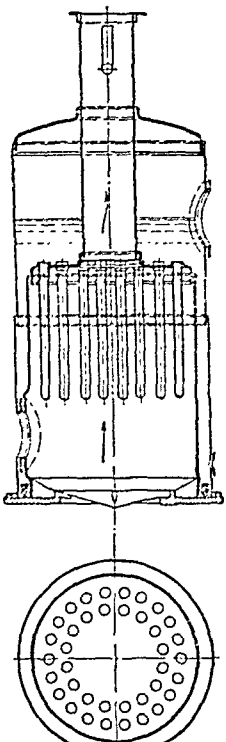


FIG. 8.—FIELD BOILER

not likely to be so great in the immediate vicinity, and they will certainly not be so disastrous to surrounding buildings as would be the results of the explosion of a tubular B. For marine purposes an added advantage is that they are proportionately lighter than tubular Bs. Again, under forced draught, especially with those having accelerated circulation, the distress to the working parts is less than in tubular Bs., while, further, they can raise steam quicker and can be repaired and replaced in parts piecemeal without the use of large hatchways or great spaces. On the other hand, owing to the thinness of the tubes, they are perhaps more liable to pitting, and may therefore require more frequent replacing in parts than do tubular Bs., and further they require good management and exceptional care and pure feed water, the attempts to use sea water, as for example, in the Belleville B., having failed.

Vertical boilers.—A minor type of B. which is only used where steam is required for small engines, cranes, or pumps, is the vertical B. They are fired internally, and since they are vertical take up little space. It is made in three types. One of these may be represented by Fig. 6, which consists of a vertical cylindrical shell having a fire-box and single flue, or up-take, between the fire-box and the B. shell, fitted with cross tubes for the water. Another form, again, is that shown in Fig. 7, which has the flue divided into several vertical tubes, each surrounded by water. The Cochran B., again, has a combustion chamber and horizontal return tubes (within a vertical cylindrical shell) leading to an external smoke-box, similar to the marine return tube B. The Field B. (Fig. 8) was the forerunner of the tubulous B., with accelerated circulation, and, as will be seen from the diagram, is a vertical cylindrical B., with a large fire-box, leading to a single central uptake. From the top of the fire-box are suspended vertical water tubes, which cause a circulation of the water leading to an accelerated steam supply. *See* L. E. Bertin, *Marine Boilers;* R. D. Monro, *Steam Boilers;* L. S. Robertson, *Water Tube Boilers.* Also Hütte, *Taschenbuch des Ingenieurs.*

Boiling, *see* COOKERY.

Boiling of Fluids, *see* FLUIDS.

Boiling of Water, *see* WATER.

Bois, John (1561-1644), translator of the Bible, was educated at St. John's and Magdalen colleges, Cambridge. He became a fellow of St. John's in 1580, and Greek lecturer at Cambridge during the years 1581-94. He was appointed one of the Cambridge translators for King James's Bible in 1604, and member of the Board of Revision. He translated a portion of the Apocrypha and of the sections from Chronicles to the Canticles. He also assisted in Sir Henry Savile's edition of Chrysostom (printed in 1610-13). He became prebendary of Ely in 1615, and published a treatise on Greek accents in 1620. His critical notes on passages in the Greek testament appeared posthumously in 1655.

Bois-Brûlés, a race of N. Americans.

largely the descendants of French-Canadians and native Indian women, more generally known as half-breeds.

Bois de Boulogne, a public park of Paris which has many walks, the largest of which forms a fashionable promenade.

Boisé, cap. of Idaho and Ada co. in the U.S., is situated on the Boisé R. in a mining dist. It is a military city, and though the chief industry is mining, it is also a shipping and manufacturing place. Pop. 6000.

Boisgobey, Fortuné du (1824-91), Fr. novelist, was born at Granville in Normandy. He became paymaster to the Algerian army, but in 1868 took to writing popular sensational stories after the style of Gaboriau, many of which have been trans. The most noteworthy are *L'homme sans Nom*, 18[illegible] *veau Paris*, 18 1880; and *Le* [illegible] he Nether- lar tion of the Aa and the Dommel, 28 m. S.S.E. of Utrecht. It has a cathedral and an art academy. There are some iron foundries, and books, woollens, cutlery, etc., are manufactured. Pop. 27,000.

Boisserée, Sulpice (1783-1854), in conjunction with his brother Melchior and a friend Bertram, were led to bring together the notable collection of 200 paintings which was afterwards sold to the King of Bavaria. This collection of early German paintings was the work of more than twenty-five years' devotion to the search, and is now in the Munich Pinakothek. B. spent many years in an endeavour to bring about the restoration of the cathedral at Cologne, and wrote sev. works of importance. His biography, *Sulpiz Boisserée*, has been published by his widow.

Boissonade, Jean François (1774-1857), a Fr. philologist, was born in Paris. In 1812 he was appointed professor of Gk. in the Academy of Paris, and was admitted a member of the Academy of Inscriptions: becoming professor of Greek in the College of France in 1828. He wrote a number of papers on philological matters and contributed frequently to the *Biographie Universelle*.

Boissy d'Anglas, François-Antoine, Count of (1756-1826), Fr. statesman, was born at St. Jean-la-Chambre in Ardèche, and died in Paris. He became a member of the States-General, and in 1794 aided the conspiracy to overthrow Robespierre. He was next elected secretary of the Convention and member of the Committee of Public Safety, in which office he had to face the hatred of he people. His last honours were his presidency of the Council of Five Hundred, senatorship under Napoleon, and his elevation to the peerage by Louis XVIII. He wrote *Recherches sur la vie, les écrits et les opinions de Malesherbes*, 1819; and *Études littéraires et poétiques d'un vieillard*, 1826.

Boito, Arrigo (1842), It. composer, was born at Padua and studied at the Milan [illegible] much i land, and in 1868 produced his opera *Mefistofele* at the Scala of Milan. It met with an extraordinary reception of mingled applause and hisses, and proved a failure, yet it has had much influence on It. composers, such as Verdi, Mascagni, and Leoncavallo. His other operas, which have never been produced, are *Ero e Leandro* and *Nerone*. He has written librettos for his own works and those of other musicians, and has also pub. songs, novels, critiques, and dramas.

Boivin, Marie Anne Victoire Gillain (1773-1841), was educated at a convent and studied midwifery for three years at Etampes. At Versailles she married Boivin, and being soon left a widow obtained a post in the Maternity Hospital, and induced Chaptal to found the school of accouchement. She wrote *Mémorial de l'Art des Accouchements*, 1812.

Bojador, Cape, a headland of W. Africa first doubled by Portuguese navigators in 1434.

Bojan, a vil. of Austria in Bohemia, with a pop. of 6000.

Bojano, an It. tn. on the R. Biferno which was anciently known as Bovianum. It is an episcopal see. Pop. about 3500, and commune 6500.

Bojardo, or Boiardo, Matteo Maria, Count of Scandiano (1434-94), It. poet and politician, born at Scandiano. In 1469 he accompanied the Duke of Este to meet Frederick III.; in 1471 accompanied the Marquis of Ferrara to Rome; in 1473 was among the escort of Eleanora of Naples to Ferrara; in 1478 became governor of Reggio; in 1481 Capitano of Modena, and in 1487 governor of Reggio again. His chief poem *Orlando Innamorato*, which was pub. unfinished in 1495, a long and not uninteresting poem, has been practically forgotten in the *Rifacimento* on the same theme by Berni, but since it inspired the *Orlando Furioso* of Ariosto, it cannot be devoid of merit. Hallam praises the poem for 'novel invention and just keeping of character.'

Boke, a tn. of Fr. Guinea in W. Africa on the R. Nunez. About 45 m. inland, occupied as a trading fort and navigable from the coast.

Bokelmann, Christian Louis (Ludwig) (1844-94), German painter, born near Bremen; one of the foremost of

German genre painters, and also noted for portrait-painting. He was a pupil of Sohn at Düsseldorf Academy, winning fame both for serious and humorous scenes. Among his best works are: 'House of Sorrow,' 1873; 'Pawnbroker's Shop,' 1876 (in Stuttgart Gallery); 'Opening of the Will,' 1879 (Berlin National Gallery); 'The Emigrants,' 1882 (Dresden Museum); 'The Arrest' (Hanover Museum). Others are 'Shoemaker's Apprentice,' 'Dawn of Day,' 'Mountebank,' 'Failure of a Bank,' 'An Itinerant Stall before Christmas,' 'Last Stage of Election Contest,' 'Portrait of Klaus Groth.' In 1893 professor of Berlin Academy. *See* Müller, 63; *Land und Meer*, i. 426 (1884).

Bokhara, a khanate of Central Asia, bounded on the N. by Russian Turkestan, on the W. by Khiva and the Russian Trans-Caspian prov., on the S. by Afghanistan, and on the E. by the Pamir dist. Much of the land is desert waste, relieved only by occasional oases, but cultivated areas are found in the valleys of the rivs., in particular that of the Amu Daria, which forms the prin. boundary on the S. In the E., N.E., and in the centre of the khanate there are low mt. ranges. The climate is subject to extremes of cold and heat, and, in view of the small rainfall, it has been necessary to introduce artificial irrigation. Estimates of the area range from 80,000 to 90,000 sq. m., the variations being due to alterations continually being made in the boundaries through conquest and encroachment. The pop. cannot be easily estimated for the same reasons, but may be given roughly as 2,000,000. The prin. tns. are Bokhara and Karshi, with pops. of 70,000 and 25,000 respectively, and there is a considerable number of tns. and vils. in the cultivated areas. The inhab. are chiefly Uzbeeks, who are also the ruling race, Kirghizes, Tajiks, Turkomans, Persians, Arabs, Afghans, and Jews. The people are mostly Mohammedans, under the gov. of an emir and his subordinate officers, each officer having absolute control in his own district, subject only to the emir, whose movements are, however, to some extent under the control of the Mohammedan priests. The commerce of the country is not very great apart from the caravan trade, but an impetus has been given by the building of a Transcaspian railway, offering greater facilities for trading with Russia. Barley, rice, wheat, cotton, silk, tobacco, wool, indigo, and various fruits are widely cultivated, and, to a lesser degree, timber. Sheep, goats (producing shawl-wool), camels, horses, and asses are reared, while among the wild animals we find tigers, antelopes, wild asses, and numerous smaller varieties. The manufs. are small, but there are large and undeveloped mineral resources. Gold and salt, however, are found and exported, though to no great extent. The history of the country in some ways resembles that of Arabia; the inhabitants being the descendants of various neighbouring peoples, who at different times have attacked and left detachments of their countrymen to inhabit the lands acquired by their conquests. Records give us little information as to the early inhab., who were Zoroastrians; but on the invasion of B. by the Arabians, the invaders gradually assumed supremacy, eventually establishing the teaching of Islam. The people are extremely fanatical and cruel, although education is widespread. Colonel Stoddart and Capt. Conolly were sent into the country to treat with the Khan of B., but were imprisoned by him, and after receiving cruel treatment were infamously put to death in 1842. Dr. Wolff visited the country in 1844 to discover their fate, and himself was imprisoned for some months by the Khan, Nasr-Ullah. Continuing a policy of encroachment, the Russians in 1865 had made their way to Tashkend, but were opposed by the Emir, or Khan, Mozaffer-Eddin, who was, however, defeated, and the Russians pushed on and took Samarkand. A treaty was concluded in 1868, under which the khan paid an indemnity and ceded Samarkand, Katti Kurghan, and neighbouring districts to Russia, while promising to protect Russian trade. In 1868 the Russians put down a rebellion, which had purposed to place the khan's eldest son on the throne. Since that time the country has become more and more under Russian rule, although still nominally independent. Among the works bearing on the country may be quoted: Curzon, *Russia in Central Asia*, 1889; Le Messurier, *From London to Bokhara*, 1899: O'Donovan, *The Merv Oasis*, 1880; and Vambéry, *History of Bokhara*, 1873.

Boksburg, a tn. in the Transvaal, S. Africa, 13 m. E. of Johannesburg. It has a large mining industry. Pop. 15,000.

Bol, Ferdinand (1611-81), Dutch painter, was born at Dordrecht. While still young, he moved with his parents to Amsterdam, and there the remainder of his life was spent. He studied under Rembrandt, and his work shows many traces of the influence of his master. His subjects were chiefly portraiture. At one public exhibition he was declared to have excelled

Rembrandt, but he degenerated into a bad imitator in his later years. Many of his pictures are to be found in the Museum at Amsterdam, while his 'Four Regents of the Leprosy [illegible] egarded as his Town Hall. [illegible] is. of the same mouth of the Rio Grande, West Africa.

Bolan Pass is a famous defile in the Hala Mts. of British Beluchistan leading into Sind. It is about 55 m. in length, and its greatest elevation is 5800 ft. On all sides there are steep precipices, and it is traversed by the Bolan R., frequently bridged over. The pass is so narrow that it is easily defended, and it is overlooked by the British fortress at Quetta. A railway has been constructed through it to connect it with the Indus valley.

Bolaram, a former British military cantonment, now part of Secunderabad, in the state of Hyderabad, India. Pop. about 10,000.

Bolas (Spanish, balls), a hunting weapon used by natives and gauchos of S. America, especially by the Paraguay Indians and natives of Argentina. There are two varieties constructed on slightly different principles, one being made of two stone or clay balls covered with leather and connected by a rope or thong of six or eight ft., the other being made of three balls connected by three short thongs which unite to form a long rope. The hunters, on horseback, throw them at the animal in such a way that it entangles its legs and prevents escape.

Bolbec, a Fr. tn. in the dept. of Seine-Inférieure, on the R. Bolbec, 19 m. from Havre. The riv. supplies water power for the mills, and this busy and thriving tn. manufs. cotton, woollen, and linen goods, has dye-works and tanneries, and trades in grain and cattle. Pop. 11,500.

Bolbocerus is a coleopterous insect of the family Scarabeidæ, members of which are usually called chafers. Their most common colour is brown or yellowish, and sometimes black; *B. mobilicornis*, a pitchy-black species, and *B. testaceus*, an ochre-coloured species, have been found in England.

Bold, Samuel (1649-1737), controversialist, was made vicar of Shapwick, Dorsetshire, in 1674. He resigned this living, and in 1688 was elected rector of Steeple, Isle of Purbeck, to which Tyncham was united in 1721. Here he remained until 1737. He preached against persecution, and published in 1682 *Plea for moderation towards Dissenters*, for which he was fined and imprisoned. His works include tracts defending John Locke's philosophy.

Boldrewood, Rolf, is the pseudonym of Thomas Alexander Browne, Anglo-Australian novelist, who was born in London in 1826 and crossed to Australia in 1830. He received a good education, but in 1844 became a squatter in Victoria, and later police-magistrate and commissioner of the New S. Wales goldfields. In 1888 he pub. his most popular work, *Robbery under Arms*, and in 1894 *A Modern Buccaneer*. He retired from the goldfields in 1895, and has since written many stories of adventure.

Bole, hydrous aluminium and iron silicates, found in Armenia, Saxony, Tuscany, S. America, Ireland, and the isle of Skye in Scotland. In form the substance resembles clay, and is of a dull yellow, brown, or red colour, while it adheres to the tongue, feels greasy, is yielding, and has a conchoidal fracture, and the streak is shining. The prin. varieties are Armenian and Lemnian, which are used as [illegible] only to [illegible] Boler [illegible] quicker [illegible] is applicable also to the dance-music. The performers are usually accompanied by castanets and guitars, and the movements are expressive of the various stages of the emotions of love.

Boletus is the generic name of some fungi of the sub-class Basidiomycetes generally found growing on the ground in woods and meadows, especially in pine woods. Some species, such as *B. edulis*, are eatable, but many others are acrid and dangerous.

Boleyn, Anne second wife of Henry VIII., daughter of Sir Thomas B., was appointed maid of honour to Mary, sister of Henry, and accompanied that princess to France in 1514. She returned some time after 1522, and soon became of importance in the Eng. court. Her gaiety and wit won Henry's favour, and her father was honoured. She refused to become the king's mistress, and determined to become queen. The removal of Catharine was thus necessary. Henry in 1524 resolved to break his marriage, on the ground that although a papal dispensation for his marriage with his brother's widow had been granted, Heaven had not sanctioned it. However, Clement VII. was in the power of Catharine's nephew, Charles V., and much as he might desire to conciliate, Henry dared not offend Charles. Meanwhile, Anne had been installed in the same palace as Catharine with royal honours. Henry's love letters to her form one of the most curious collections in our literature. Furious at the repeated delays of the papal court, Henry vented his wrath on Wolsey, who

was dismissed in 1529, and on the advice of Cromwell, appealed to the universities. On Jan. 2, 1533, Henry was secretly married to Anne, and later she was crowned. On Sept. 7, at Greenwich, was born the Princess Elizabeth. Anne's frivolity soon began to displease her royal husband. On Jan. 6, 1536, Catharine died, sending a letter of forgiveness to the king. It is said that Anne's heartless reception of the news finally estranged Henry, but it is certain that during the early months of the year there were quarrels. Finally, at a tilting match on May 1, 1536, a harmless act of gallantry by Sir Henry Norris made Henry's anger burst forth. On May 2, she was committed to the Tower; on the 17th, she was tried for adultery by a court of twenty-four peers, under the presidency of her uncle the Duke of Norfolk, and condemned to be burnt or beheaded, according to the king's pleasure. The evidence brought forward has been lost, but it seems probable that her greatest crimes were vivacity, and not bearing an heir to the crown. Moreover, she was hated by the Catholics as being a 'spleeny Lutheran.' She was beheaded on the 19th, Henry ostentatiously wearing white; on the next day he married Jane Seymour.

Boleyn, Sir Thomas (1477-1539), English statesman, father of Anne B. Fought with his father against Cornish rebels, 1497; 1509 became keeper of the exchange at Calais and of the foreign exchange in England. Joint-constable of Norwich Castle, 1512. B. was employed on a number of diplomatic missions during Henry VIII.'s reign, and held many high offices, doubtless owing largely to his daughter's influence with the king. He went with Poynings on an embassy to the Low Countries; invaded France, 1513. 1517 became sheriff of Kent; 1519-20 on an embassy to Francis I., negotiating the preliminary arrangements for the Field of the Cloth of Gold. 1521 he was one of the commission by which the Duke of Buckingham was condemned; Wolsey's agent in Calais in the autumn. Earl of Wiltshire, 1529; Lord Privy Seal, 1530. Ambassador to Charles V., on the business of Henry's divorce. See *Calendar of Henry VIII.* (iv.).

Bolgary, a Russian vil. in the prov. of Kazan on the R. Volga. It is built on the site of the anct. city of Bolgar or Bulgar, the old cap. of the Bulgarians, of unknown antiquity, but now consists of less than 200 houses. It still contains ruins of its former glory, and coins, implements, and inscriptions have been discovered during excavations. It was sacked by Tamerlane in the 14th century. Pop. about 1000.

Bolgrad, a Russian tn. in Bessarabia on Lake Yalpukh. It manufs. soap, tallow, and bricks. Pop. about 12,500.

Boli (Gk. πόλις, city), a tn. of Asia Minor in the prov. of Kastamuni on the R. Boli. It manufs. cotton and woollen goods. Pop. about 10,000.

Bolide (Gr. βολίς, a missile), a fireball or meteoric body of greater brilliance and slower motion than the ordinary 'shooting star.' *See* AEROLITE, METEOR.

Bolingbroke, Henry St. John, Viscount (1678-1751), was born at Battersea. He was educated at Eton, and his youth was notorious even in that hard drinking and riotous period by reason of his orgies. He was a schoolfellow of his great opponent Sir Robert Walpole, and was returned to parliament in 1701 for Wooton Basset in Wiltshire. By his eloquence in debate he was soon able to command the attention of the House of Commons, and he attached himself to the Tories, at this time led by Harley. In 1704 he became Secretary for War, in 1708 he retired with Harley, and in 1710 he again came back to office in another of Harley's ministries. He was responsible for the treaty which was made secretly with France to end the war of the Spanish Succession, and has often been accused of not having pushed the advantage which Great Britain had to its full extent in the negotiations. In 1712 he was made Viscount B. and Baron St. John. In the meantime a quarrel had taken place between Harley (now Earl of Oxford) and B. which Swift attempted to patch up, but which in spite of all efforts still continued. The whole energies of the two ministers were not concentrated on the events which were to follow the death of Anne, an event which was now expected. Both were pledged by correspondence to the Old Pretender, and B. seems also to have pledged himself to him in secret interviews which had taken place while B. was in France. The quarrel with Harley ended in victory for B., and Harley left the ministry. B. was now supreme, and his extreme Tory policy was favoured by the queen, whilst his attitude towards Hanover also found high favour at the court, a Jacobite restoration seemed inevitable when the queen died suddenly, and B. was ruined by the action which led to the appointment of the Earl of Shrewsbury to the lord treasure ship. What exactly his plans were does not seem to be known, he was certainly intriguing with both parties, and his illuminations on the accession of George I. were noticeable by their extrava-

gance. He was, however, immediately dismissed. In 1715 he attempted to defend his ministry against the attacks of the new parliament, and in the same year fled to Paris from the threatened attack on the treaty of Utrecht by Sir R. Walpole. He entered the service of James II. the Old Pretender, but after the failure of the '15 was dismissed. He now attempted to enter into Eng. politics again, but was not pardoned until 1723. By means of bribing the king's mistress, the Duchess of Kendal, he was able to obtain many privileges, and at last seemed to be on the point of obtaining a ministerial appointment when his hopes were again thrown down by the death of George I. He still continued his attacks on Walpole, and continued his attempts to obtain political power. He was kept out of the House of Lords by Walpole. He retired into private life in 1735, and c[illegible] and his intima[illegible] leading men o[illegible] He wrote many [illegible] may b[illegible] *Exile*, [illegible] *The Tr*[illegible] *Patriot* [illegible] man of letters is not so great to-day as it was during his own time. His *Patriot King* was the text-book from which Bute attempted to teach George III. the elementary principles of kingship, but altogether B. was a brilliant man who made his mark upon his contemporaries, but had not depth enough to be able to impress posterity. He was buried at Battersea.

[illegible] Dimitrie (1826-72), a [illegible] was born near [illegible] ting France he [illegible] where for sev. months he ed. *Le Peuple Souverain*, 1847. *In* 1848 he was banished for political reasons, and he then spent several years in travelling, returning again to Bucharest, where he died. Among his best known works are *Brises d'Orient*, 1866, a translation into Fr. by the poet himself, and *Cântătoriă pe Dunăre si in Bulgaria*, 1858.

Bolitophagus is a genus of coleopterous insects of the family Tenebrionidæ; they are closely related to [illegible] other genera of [illegible] e on fungi, but *B. agaricola* [illegible] rgest state of Venezuela, bounded on the N. by the Orinoco R., on the E. by the ter. of Yuruari, and on the S. by Brazil. The cap. is Ciudad B., better known as Angostura. Estimates of the pop. and area vary widely.

Bolivar, a small prov. in Central Ecuador. The cap. is Guaranda.

Bolivar, Simon (1783-1830), El Libertador, the hero of S. American independence, was born in the city of Caracas, in Venezuela. He was descended on both sides from noble Venezuelan families. He studied in various European capitals, especially in the law schools of Madrid, and was the witness of the final scenes in the Fr. Revolution in Paris. He married in 1801, and returned to Venezuela, where, however, he did not long remain, the death of his wife very shortly after their marriage resulting in his return to Europe (1804). His visit to the U.S. in 1809 resulted in his joining the party of independence in Venezuela, and he was regarded as an important recruit, being given an important post to defend in 1811 on the declaration of Venezuelan independence. The at[illegible]d revolt was, however, a [illegible] and B. fled to Curaçoa. In [illegible]e joined the insurgents at [illegible] renada, and at the head of a small force, forced the crossing of the R. Magdalena, and with 500 men pushed on to victory and proclaimed war to the death. His success was only transient, and in 1814 his defeat by Boves, and the success of the royalists generally, forced him again into exile. He went to New Grenada, and from there to Kingston, where an unsuccessful attempt was made on his life. Undaunted by the ill-success of a landing on the mainland in 1816, in the following year he was successful in driving the royalists before him and in reaching and making his headquarters at Angostura. Here a congress was held in 1819, and afterwards he joined forces with the republicans of New Grenada, and was entirely successful. He was now generally recognised as the hero of liberation. He succeeded in uniting Venezuela and New Grenada into one republic of Colombia, and was successful in his attacks against the Spaniards, who may be said to have been finally defeated at Carabobo in 1821. In the same year the constitution of Colombia was adopted, and B. became the first president. The next year he added Ecuador to the republic, and was later called to the help of the Peruvians, who were fighting for independence. At the end of two years' hard fighting their independence was won, and in 1825 the upper part of Peru changed its name to Bolivia in his honour. The constitution prepared by him for that country, however, did not prove popular, owing to its arbitrary proposals, and was finally rejected by the Bolivians. He was, however, again elected president of

the Colombian republic, but his dictatorial methods had roused general alarm, and the dread of a dictatorship put aside all past services. In 1829 Venezuela separated from Colombia, and in 1830 B., being voted a pension of 3000 dollars, conditional on his residence elsewhere, led to his resignation of his power in Venezuela. His life and his fortune were given practically for the liberation of S. America, and his influence purified financial and judicial methods. His adoption of dictatorial methods was almost justified by his position, and he certainly was successful in creating a new spirit of independence and liberty in South America.

Bolivia, the third largest political div. of the continent of S. America. It is conterminous with five different states, having Brazil on the N. and E., Peru and Chile on the W., and Argentina and Paraguay on the S. Its boundaries are purely conventional, following practically none of the physical features of the land, and cannot be altogether accurately stated, since they are continually the subject of dispute. It extends practically from 9° 44′ to 22° 50′ S. lat., and 58-70° W. long. After the war with Chile it became for a time a land-locked country, but obtained in 1895, by considerable territorial concession to Chile, a small seaport and access to the Pacific by means of a small strip of ter. running through anct. Peruvian ter., and which is still in dispute with the Peruvians. It has also secured an outlet to the Atlantic by the R. Parana, a riv. which is also free to all flags. Its area and pop. are still the subject of considerable dispute; the area can, however, be taken as about 567,000 sq. m., and its pop. at roughly a little over 2,000,000. Its pop. may be divided into three fairly well-defined groups—the aborigines, Indians, who number between 200,000 and 300,000; the Mestizos, natives with a slight European strain, who number nearly 1,000,000; and Europeans, who number between 600,000 and 700,000. Naturally, an ill-assorted pop. such as this is liable in times of weak or bad administration to become a standing menace to the gov., and during the frequent disorders in B. they have often been a source of grave danger to the stability of the state.

Physical features.—In B. the Andes approach closely the Brazilian uplands. In the western district there are two main ranges, the Western Cordilleras, which are really now in Chilian ter., and the Cordillera Real, which is the name given to the section of the Andes on the E. side of Titicaca. In this group are found the Sorata (23,000 ft.) and the Illimani (22,500 ft.). A remarkable feature of B. is the great table-land lying between the Andes and the Cordillera Real, which has an elevation of over 12,000 ft., and which contains the Lake Titicaca. The lake is about 120 m. long, and has a depth of about 120 fathoms. Although B. is usually taken to be a very mountainous country, in reality at least three-fifths of it is made up of low-lying and swampy ter. In the N.E. there is an extensive plain, which is both well watered and well wooded, and is valuable for its supply of timber trees. The prin. rivs. are the Paraguay, the Pilcomayo, and, belonging to the basin of the Amazon, the Mamoré, the Rio Beni, the Guapore, and the Mochupa. The Chiquite dist. forms part of the Yungas Zone, a name applied to the hot eastern slopes of the Cordilleras which merge into the wooded plains of the Amazon. B. lies in the torrid zone, and its climate depends upon the elevation, and not upon the lat. In the mt. heights perpetual winter reigns, some of its heights being absolutely uninhabitable; between an elevation of 11,000-9000 ft. the climate is of the temperate zone; whilst in the Yungas Zone the climate is tropical, producing all tropical fruits and vegetation. The plains are hot and moist, and covered with dense forests. The indigenous flora comprises the palm, the cinchona, the bamboo, maté, and coca. Other productions of B. are balsam, bananas, caoutchouc, vanilla, copal, coffee, cotton, sugar, potatoes, and tobacco. Amongst its indigenous animals may be mentioned the llama, alpaca, vicuña, guanaco, chinchilla, viscacha. All forms of S. American bird life are found here, and an indigenous species of stork called the bata is peculiar to this part of the continent.

Minerals and vegetable produce.—B. is still famous for its silver mines, 1,500,000 pounds weight of silver being exported annually. Other metals which are found in large quantities are tin, copper, and gold; lead, mercury, and iron are also found in fair quantities. In the southern provs. salt is found in large quantities, but coal appears to be rare. Amongst the other products of the country may be mentioned wheat, barley, and other cereals, the production of which is, however, retarded, as is agriculture generally, by the lack of a good system of communications. The lower zone is remarkably adapted for the production of maize, cotton, and tobacco, but these industries are not developed. The forest products are cinchona and rubber.

Communications.—The communications are in general bad, in some parts of the country bridle roads forming the only means of transport. Railways are beginning to be developed, but all real progress in the country is hampered by this deplorable lack of [illegible]

Constitution.

which dates f[illegible]

executive in a president, elected for four years and not eligible for re-election; a senate of eighteen members and sixty-four deputies, who together make up the congress and are elected by universal suffrage. The senate is elected for six, the deputies for four years. The state religion is Roman Catholic, but to a very large extent the principle of toleration is accepted. Education is free and supposed to be compulsory, but is in a very backward state. Military service is compulsory, and there is a standing army (national guard) of about 1500 men.

Bolkhov is a Russian city on the Nougra, in the gov. of Orel, and 36 m. N. from it. It trades with St. Petersburg and Moscow in manufs. of leather, hosiery, hemp, rope, cattle, etc. Pop. 27,105.

Boll, from M.E. (Sc.) *bolle*, and the same word as the Eng. 'bowl,' is an old Scottish measure, used for grain, etc. It is still in vogue in many parts of Scotland, although it is not recognised by law. It is used also in the northern counties of England and in the Isle of Man. The B. varies in different places and for different articles. The wheat B. is the equivalent to 4 or 4½ bushels, and this answers for peas, beans, etc. The potato B., however, is from 8½ to 9 bushels. A B. of flour or meal is supposed to be 140 lbs. avoirdupois. A B of land is about a Scottish acre; a B. of canvas measures 35 yards.

Bollandists, *see* BOLLANDUS, JOHN VAN, and ACTA SANCTORUM.

Bollandus, John van (1596-1665), Dutch Jesuit, has given his name to the Bollandists, a Jesuit association by whom the *Acta Sanctorum*, a collection of the lives of the saints of the anct. Rom. and Gk. and the modern Rom. calendar, have been pub. B. took up the work at the death of Heribert Rosweyd, of Bois le Duc, who had already conceived the idea and died in 1629. B. settled in Antwerp, and associated himself, personally and by correspondence, with Jesuits all over Europe, enlarging the scope of the work as he amassed fresh material. In 1643 he issued the two vols. for January, and in 1658 the three for February, the work being continued after his death. He was assisted after 1635 by Godfried Henschen, and after 1659 by Daniel von Papenbroeck.

Bollene, a tn. of France, in the dept. of Vaucluse. It is situated 22 m. to the N. of Avignon. Silk-spinning and the manuf. of castor-oil are among its manufactures. Pop. 5693.

Bollington: 1. A vil. in Cheshire, England. It is situated near the R. Bollin, and has a pop. of 272. 2. A tn. of E. Cheshire, 2½ m. N.E. of Macclesfield. It has silk and cotton manufs., and a pop. of 5464.

Bollullos par del Condado, a tn. and com. of Spain, situated 20 m. N.E. of Huelva; pop. about 7000.

Bologna, a fertile prov. of the compartimento of Emilia, Italy. It has an area of about 1390 sq. m., with a pop. of nearly half a million. Its irrigation system is of great value in the cultivation of its rice fields. It raises large numbers of silkworms. It is surrounded by Ferrara, Ravenna, Modena, and Florence; its cap. tn. is Bologna.

Bologna, city of Italy, the cap. of the prov. of that name and the archiepiscopal see for Emilia. It is situated on the edge of a fertile plain and at the crossing of two great railways. It lies in lat. 44° 29' N., long. 11° 21' E. It is a rectangular city surrounded by a high brick wall, entered by twelve gates and intersected by the Reno Canal. The newer part of the city is noted for the magnificence of its colonnades, its well-paved streets, and its fine buildings. In the older part of the city the streets are narrow and dirty, and cannot be compared with the newer portion. Above all things B. is noted for its anct. buildings, these being famous both for their antiquity and for their beauty. The city is also noted for the magnificence of the palaces erected by a mediæval nobility, and for the historic scenes that have been enacted within them. Its university, claiming a foundation in the early 5th century, can certainly be regarded as the oldest law school in Europe. Since the 11th century it has been famous as a university, and during the middle ages thousands of students flocked to it from all over Europe. Amongst its numerous famous students may be mentioned the poet Tasso. As a school of medicine it also rapidly became famous, claiming to have been the first medical school that dissected the human body. Its students now number nearly 2000. In addition to its university it has an academy of fine arts, a school of music, a library with over 200,000 vols., a museum of antiquity, and a botanic garden. Its churches contribute much to its glory and magnificence. Amongst these churches may be mentioned the

oldest, San Stefano, a group of seven buildings of various dates, the oldest being of the 4th century, the building in present use of the 10th, San Domenico, the resting-place of the saint who died here in 1221; this church contains some of the work of Michael Angelo. The largest church, S. Petronio, was begun in 1390, but never finished, but remains a magnificent example of Gothic architecture. The town has given numerous popes to the church and an extraordinary number of cardinals, altogether about 200. The present tn. is built on fairly modern lines, and is especially noted for the famous B. sausage, for its tortellini, and for its liqueurs. It manufs. also paper, silks, and musical instruments. Historically it has had a somewhat changeable career. During the early period it was overrun by Lombards, but remained a part of the exarchate of Ravenna. It became a free and independent city in the 12th century. It played an important part in the wars of the Ghibellines and Guelphs, and finally after many vicissitudes passed into the hands of the papacy. During the Napoleonic period it became the chief tn. of Napoleon's Cisalpine republic, and reverted to the papacy by the treaty of Vienna in 1815. Its inhab. were fervid supporters of the cause of United Italy, and in 1860 it became a part of the kingdom of Italy. Pop. 152,000

Bologna, Giovanni (1524-1608), a sculptor and architect, was born at Douay, and studied at Rome, after receiving some instruction from his compatriot, Jacques Dubræucq. At Rome he received some advice from Michael Angelo, then in the zenith of his fame. He then went to Florence, and in 1558 was attached to the court of the Medicis as sculptor. He married at Bologna, and then took the name by which he is known, G. B., having formerly been known as 'Jean Boulogne.' He is also known as 'Giam Bologna,' whilst the Fr. call him 'Jean de Douai.' His works are elegant and imposing in character, though not free from mannerisms. Among his numerous works may be mentioned 'Samson killing the Philistines,' now at Hovingham, Yorkshire; 'Statues of the Rivers Nile, Ganges, and Euphrates;' 'Neptune and Four Sirens,' for the public fountain of Bologna; a bronze 'Mercury,' at Florence; the 'Rape of the Sabines,' also at Florence.

Bologna Phial, a glass vessel made first at Bologna, hence its name. It is narrow and closed at one end, and is used in the manufacture of bottles and such like articles. By means of this phial the exact colour of the molten glass or metal can be ascertained.

Bologna Stone was originally found in clay near Bologna. It is one of the barytes group of minerals, and after being heated with charcoal and exposed to the rays of the sun it has phosphorescent qualities. This was one of the first observations of phosphorescence from inorganic matter. When this mineral is heated with charcoal it is reduced to barium sulphide.

Bolometer, an instrument used to measure small differences in temperature and based upon the phenomenon that heat imparted to a metal increases its resistance to electricity. It was invented in 1880 by Samuel P. Langley, an American physicist, who sought a more efficient instrument than the thermopile. The B. consists of a thin strip of platinum foil blackened with lamp-black and arranged to form one arm of a Wheatstone's bridge, while a strip of similar resistance constitutes the other arm. The blackened strip alone is exposed to the heat rays, and the slightest increase in temperature decreases its conductivity; the equilibrium of the bridge is therefore disturbed, and the extent of such disturbance is indicated by the deflection of the connected galvanometer. In order to attain great delicacy, the platinum strips are made exceedingly small in section, being sometimes $\frac{1}{400}$ inch wide and $\frac{1}{2500}$ inch thick. With such an instrument the inventor discovered an extension of the infra-red rays of the spectrum which could not be detected by any other instrument. It has also been used to estimate the intensity of the energy of radiant heat. After being exposed to radiation for a measured time the rays are cut off and the increase of current necessary to produce the same increase of temperature noted. The B. has also been employed in wireless telegraph receiving apparatus. The platinum in this case is in the form of a loop of fine wire enclosed in an exhausted glass bulb after the manner of an electric incandescent lamp. Electric oscillations passing through the bulb increase the resistance of the wire and thus cause the galvanometer to deflect.

Bolor Tagh, a lofty ridge of mts. on the border of the Pamir plateau in Central Asia. The anct. kingdom of Bolor was once close to the B. T.

Bolsena, a tn. belonging to Rome. It is situated on the northern shore of the lake of B. In anct. times it was a place of very great importance. Close to the tn. there are traces of one of the Etruscan cities; the chief of the ruins are those of a temple, and also an amphitheatre. Other relics of the past are to be found, some of which

have been built into modern places. Pop. 3295.

Bolsena is the lake upon which the tn. of B. stands. It is 10 m. long and [illegible] volcanic [illegible] healthy, [illegible] Martana and Bisentina are two islands which were often visited by Pope Leo X.

Bolsover is a tn. in Derbyshire, England, 6 m. E. from Chesterfield, and situated upon a ridge of the Pennines. There are coal mines in the neighbourhood, also quarries of limestone. B. Castle, which is well preserved, is a very anct. structure built in the 11th century.

Bolsover Stone is the name given to the yellow limestone found at Bolsover in Derbyshire. It was selected for its strength, durability, and colour for the construction of the Houses of Parliament.

Bolsward is an old tn. of Holland, in Friesland. It is situated at the junction of many canals. It trades in dairy produce and cattle, and is noted for the manuf. of worsted. There are shipbuilding yards, brick yards, and potteries.

Bolswert, Sheltius (*b.* 1586), Dutch engraver, born at Bolswert, the brother of Bœtius Adam B., lived at Antwerp. His prints after Vandyck and Rubens are particularly faithful reproductions [illegible] Vandyck's 'Crucifixion' is one of his best productions.

Bolt: 1. From an A.-S. and Dan. word signifying knob (cf. *bole*); a metal or wooden pin with a knob to it, as the B. of a door. In time any stout pin came to bear this name, and we have Bs. of many kinds, used in fastening together structures of wood and metal, as ships, bridges, machinery. The short heavy 'quarrel' of a cross-bow and the 'long-shot' of a cannon were both Bs.; also a roll of textile material, *e.g.* a *bolt* of cotton sheeting. A bundle of reeds or osiers bears the same name. A prisoner's shackles were thus called, as in *Measure for Measure*, 'Lay bolts enough upon him.' From the cross-bow missile we get the metaphorical idea of something striking suddenly and swiftly, as 'a thunder-bolt,' 'a bolt from the blue,' and the noun suggests a verb, 'to bolt,' meaning to rush suddenly, as 'the horse bolted.' In farming, a crop that runs to seed prematurely is said to B. 2. From Old Fr. *buleter* or *bureter* (said to be from *bura*, a kind of cloth, cf. It. *buratto*, a meal-sieve) we have *boll*, sometimes spelt *boult*, a frame covered with a net of fine material for sifting the flour from the bran. From this comes the verb 'to bolt,' meaning to sift out. Burke says, 'This must be bolted to the bran,' *i.e.* closely reasoned out to distinguish true from false. And in Milton's *Comus*, 'I hate when Vice can bolt her arguments.'

Boltenia is a genus of tunicates found in Australasia, the Arctic, and N. Atlantic. It belongs to the order Ascidiacea and family Cynthiidæ. The species, which include *B. orifera*, *B. fusiformis*, *B. reniformis*, and *B. globifera*, remain fixed to rocks and stones by the long stalk of the body, and show little signs of life.

Bolthead, or a receiver or matrass, is a glass vessel used in chemical distillations. It is in shape long, with a straight neck.

Bolton is a large and important municipal and parl. bor. in S. Lancashire, England. It is situated on the R. Croal, and is 10 m. from Manchester, and 200 from London. It is a railway centre for the L. and N.W. Railway, also the Lancashire and Yorkshire railways. It is one of the chief manufacturing tns. of England, specially noted for cotton fabrics. Heavy goods—counterpanes, etc.—and also finer things, as muslins, calicoes, etc., are made. There are large foundries, iron works, bleaching, dyeing, and chemical works, and paper mills. The coal mines of the neighbourhood are numerous and important. B. is a place full of historic interest. The Flemings introduced the cotton and woollen manuf. in the 14th century. Fr. and Ger. refugees emigrated here, and brought new industries with them. Arkwright lived and worked in B., and Crompton was born here. There are many large public buildings and parks. It possesses three weekly and three evening newspapers. It returns two members to parliament. Pop. 187,824.

Bolton, Sir Francis John (1831-87), Eng. soldier and electrician. He enlisted in the Royal Artillery, obtained a commission as ensign in the Gold Coast Artillery Corps, 1857, served at Crobboe Heights, 1858; 1859 B. was adjutant in the expedition against the Dounquah rebels. On returning to England he became captain of the 12th Foot Regiment, 1860. With Colomb he developed a system of visual signalling, also inventing oxy-calcium light for night-signalling. With Colomb and an officer of royal engineers he compiled the *Army and Navy Signal Book*, used in Abyssinian campaign, 1867; 1867-9 engaged at School of Military Engineering, Chatham, under Stothard; became brevet-major, 1868. One of the founders and honorary secretary of the Society of Telegraph Engineers and Electricians, 1871; edited their

Journal; water-examiner to the metropolis; 1881 retired from military service as honorary colonel; knighted, 1884. He designed and controlled the coloured fountains and electric lights at the exhibitions at S. Kensington, 1883-6. Wrote *London Water-supply*, 1884; *Description of the Illuminated Fountain and of the Water Pavilion*. See *Royal Engineers' Journal*, February 1887.

Bolton, Sir Richard (*c.* 1570-1648), Eng. lawyer, practised as a barrister in England and Ireland. In 1604 became recorder of Dublin; member of the society of King's Inns, Dublin. 1610-3; M.P. for Dublin, 1613; knighted, 1618; 1619 B. was solicitor-general for Ireland; 1621 he pub. *Statutes of Ireland* (from Edward II. to James I.); attorney-general to court of wards, Dublin, 1622; chief baron of Irish exchequer, 1625. In 1638 B. pub. *A Justice of the Peace for Ireland;* 1639 became chancellor of Ireland. He was one of Strafford's chief advisers over introducing arbitrary gov.; 1640-2 B. was impeached for high treason, but the impeachment was abandoned, and he resumed his position as chancellor. He took part in preparing a statement as to the English administrative system in Ireland; 1643-4 chief counsellor of Ormonde, negotiating for cessation of hostilities between English and Irish, and especially with the Irish Confederation for peace; 1646 B. signed the proclamation of a treaty of peace between Charles I. and his Irish Roman Catholic subjects. He joined in Ormonde's statement to Charles I. of the condition of Ireland, 1646-7. See *Contemporary History of Affairs in Ireland*, 1641-52, 1879; Carte's *Life of Ormonde*, 1736; Carte MSS. Bodleian Library, Oxford.

Bolton Abbey. The picturesque ruins of this one time important priory are situated on the banks of the Wharfe R., in the West Riding of Yorkshire, England. It was founded in 1121 by William de Meschines, for the order of St. Augustine, about 2 m. from its present site. The date of its removal is uncertain, but it was dissolved in 1540. A portion of the nave has been used as a parish church, but the tower and a very fine E. window are practically all that is left of the building. The ruins are so hidden in woods that they are not noticed until the visitor is very close. The surrounding scenery is most beautiful. The poet Wordsworth has founded his poem *The White Doe of Rylstone* upon a legend connected with the old abbey.

Bolus, a round mass of substance with medicinal qualities. It is soft and larger than a pill, though it is intended to be swallowed in the same way.

Boma is the cap. of the Belgian Congo State. It is situated on the r. b. of the R. Congo, at about 40 m. from its mouth. It was originally named Lombi, or Embomma. The harbour is formed by the is. of Nkete, and the riv. bank, and is a m. wide. It exports ivory, gum, rubber, nuts, and palm oil.

Bomarsund was at one time a Russian fortress on the is. of Aland, in the Baltic Sea, and commanded the Gulf of Bothnia. It was taken by the Fr. and Eng. on August 16, 1854, who destroyed it after a bombardment lasting a week. The Treaty of Paris bound the Russians not to rebuild it.

Bomb, *see* ANARCHISM. EXPLOSIVES.

Bomb, in geology, the name applied to a round mass of lava which has been ejected from the crater of a volcano.

Bombaceæ is an order of dicotyledonous plants consisting of large trees which are found most commonly in America. The flowers are hermaphrodite, have five joined sepals, five free petals, five or more stamens either free or joined to form a tube, two to five superior joined carpels, which are multilocular, and contain two or more ovules in each loculus. The fruit often contains hairs which form a cottony substance but are too short to be made into linen. Two of the chief genera are Bombax and Adansonia, or the Baobab.

Bombala, a tn. of Wellesley co., in the extreme S. of New South Wales, Australia, 320 m. S.W. of Sydney; pop. 1500.

Bombard is a kind of cannon, introduced before the 15th century, which could throw stone balls from 250-500 lbs. weight. They were breech-loaders, thick, and with a wide aperture, sometimes made of wrought-iron bars hooped together. Such a one was 'Mons Meg,' used at the siege of Dumbarton, 1489.

Bombardier is the name of the lowest grade of non-commissioned officers in the Royal Artillery, corresponding to corporals in the line regiments: an acting B. corresponds to a lance-corporal. The number of Bs. in a battery is nine. The name owes its origin to the 'bombard,' a piece of ordnance used in the bombardment of fortified places; a man employed in looking after 'bombards,' 'howitzers,' 'mortars,' etc., was known as a bombardier.

Bombardier Beetle is the popular name of sev. species of coleopterous insects of the family Carabidæ. They obtain their name from the fact that they can emit explosively from their bodies, when alarmed, a pungent acrid

fluid. A report follows the discharge, and the fluid instantly evaporates. *Brachinus crepitans* is the commonest British species and occurs in chalky districts.

Bombardment, an attack upon a fort. tn., fortress, etc., by means of continuous artillery fire. A real B., however, consists in the continual attack on the buildings and undefended portions of a tn. in order to harass and attack the civil pop., and so bring pressure to bear upon the governor or commandant of the tn. to induce him to surrender. A B. used in order to produce psychological pressure on the inhab. has, however, been condemned as immoral. The Hague Conventional Law of War (1907) lays down the following articles in connection with B.:—Art. 25. The attack or B., by whatever means, of tns., vils., dwellings, or buildings, which are undefended, is prohibited. Art. 26. The officer in command of the attacking force must, before commencing a B., except in cases of assault, do all in his power to warn the authorities. Art. 27. In sieges and Bs. all necessary steps must be taken to spare, as far as possible, buildings dedicated to religion, art, science, or charitable purposes, historic monuments, hospitals, and places where the sick and wounded are collected, provided they are not being used at the time for military purposes. It is the duty of the besieged to indicate the presence of such buildings or places by distinctive signs, which shall be notified to the enemy beforehand. Art. 28. The pillage of a town or place even when taken by assault is prohibited. An open tn. is liable to be bombarded if it is in any way defended, or if the exigencies of military necessity demand it, *i.e.* if it can in any way be used by the enemy as a point of vantage. The main reason for a B. has already been given as a means of inducing the civil pop. to bring influence to bear which will lead to the ultimate surrender of the tn., but this has been proved to be not always successful. The case of the siege of [illegible] as a case in point may be quoted as a case in point very much properly d in addi- the guns which are employed. The B. of a fort. tn. does not of a necessity mean only the B. of the fortifications. The commandant of a bombarding force has the right to range his guns over the whole of the city, saving always those buildings which are mentioned in Art. 27. Notable Bs. have taken place at Sebastopol, Strasburg, Paris, Soissons, and Verdun. Strasburg may be taken as an example of a tn. that underwent a terrific B., as the tn. was bombarded continually day and night. Later, when siege operations began, the fortifications were shelled all day, and the town itself all night. When the surrender took place nearly 800 houses had been destroyed, considerably more than half of the total number of houses were injured more or less severely, 2000 of the civil inhab. killed, and over 10,000 made homeless. Many differences of opinion have been expressed with regard to Art. 26, some authorities holding that B. should not begin until ample warning had been given the inhab., others that a besieged or threatened tn. should be prepared for B. at any time without notice. Another point which has led to much discussion is as to whether non-combatants should be allowed egress from a tn. about to be bombarded or not. One opinion expressed, which, however, does not find general acceptance, is that by the B. of a number of non-combatants public opinion is roused against the war, which hence comes to an end more rapidly than it would otherwise, and thus the end justifies the means. As has been already stated, however, that point of view of psychological pressure has been condemned as immoral.

Bombax, the typical genus of Bombaceæ growing in tropical countries. It consists of large trees with a soft spongy wood frequently used for making canoes. *B. Ceiba*, common silk-cotton tree, a native of W. Indies and S. America, reaches a height of 100 ft. The down in the seed-vessel is made into hats and bonnets, and is used for stuffing chairs and pillows. *B. malabaricum*, the cotton-tree of Ceylon and India, sheds its leaves in December and flowers during the months it is leafless. *B. pubescens* attains a height of 20 to 30 ft., and in Brazil its tough bark is used in rope-making.

Bombay (*presidency*). The most westerly and smallest of our Indian presidencies, and stretching from Baluchistan to Mysore, consists partly of British dists. and partly of native states under the administration of a governor. The prov., including Aden and Sind, comprises twenty-four British dists and nineteen native states, and has an area of 197,887 sq. m., of which 73,753 sq. m. are in native states. The total pop. (1901) is 25,486,209, of which 18,515,587 are in British ter., and 6,908,648 in native states. The prov. is divided into four commissionerships and twenty-six districts. The four divs. are (1) the northern or Gujurat, (2) the central or

Deccan, (3) the southern or Carnatic, and (4) Sind. The native states are under the supervision of the Governor of Bombay, and are divided historically and geographically into two parts. (1) The northern or Gujurat group includes Baroda and other administrative divisions of Cutch, Palanpur, Kewa Kantha, and Mali Kantha. (2) The southern or Mahratta group includes Kolhapur, Akalkat, Sawantwara, and the Satara and Mahratta Jagirs. The surface of the prov. is very rugged on the whole. The great plateau of the Deccan stretches southward from the Vindhyas, and is buttressed by the western and eastern Ghats. The chief mt. ranges are the Western Ghats, stretching all along the coast-line, the Vindhya Mts. in the N.E., and S. of these the Satpura Hills. The N.W. portion is flat. The chief rivers are the Tapti and Nerbudda, flowing into the Gulf of Cambay, the Luni flowing into the Gulf of Cutch, and Sind is watered by the Indus. The southern portion of B. is watered by the tribs. of the Kistna and Godaveri. The climate is remarkable for its great varieties. In its extreme dryness and heat Upper Sind resembles the sultry deserts of Africa. In Cutch and Gujurat the heat, though less, is very great. The table-land of the Deccan has on the whole an agreeable climate, except in the hot month. The same applies to the Mahratta country. B. Is., though cooled by the sea-breezes, is oppressively hot in May and October.

Agriculture.—Joar and bajra are the staple food-grains in the Deccan and in Khandesh. Wheat is also largely grown throughout the presidency, and especially in Sind and Gujurat. Barley is also grown. The prin. oil-seeds are til, mustard, castor-oil, safflower, and linseed, and the chief fibres are Deccan hemp and cotton

Industries.—The prin. manuf. is cotton. Steam mills have been erected in B. City, Ahmedabad, and Khandesh. The industry is centred in B. City and Is. Ahmedabad and Surat are famous for carved woodwork. Salt is largely obtained from the gov. works at Karaghoda and Udu in Ahmedabad. B competes largely with Manchester in the Indian mrkts., and exports its own manufs. to a large extent. Other great staples are opium, wheat, and oil-seeds.

Education.—A university was estab. in 1857, consisting of a chancellor and vice-chancellor and fellows. The total number of educational institutions in 1905 was 10,191, with a little more than 500,000 pupils. The educational dept. is under a director of public instruction, who is responsible for the administration.

Languages.—In the S. are the Marathi and Canarese, Gujurati in the N.W., Sindi in Sind, and Baluchi W. of the Indus. The prin. castes are (1) Parsees, descendants of ancient Persian fire-worshippers, and (2) the Borahs (sprung from early converts to Islam). Both are remarkable for their commercial activity and enterprise.

Administration.—Gov. of B. is administered by a governor, a council consisting of the governor as president and two ordinary members. The governor is appointed from England, the council by the crown, and selected from Indian civil servants. For making laws there is a legislative council consisting of the governor and his executive council with certain other persons not less than eight or more than twenty. Administration of justice is conducted by a High Court at B., consisting of the chief justice and seven puisne judges, together with dist. and assistant judges throughout the dists. of the presidency.

Bombay, the cap. of the presidency, stands on a small is. which is connected with the mainland by an artificial causeway. It is the largest and safest harbour in India, and one of the great seaports of the world. It occupies the best position for commerce in the whole of Asia, and since the opening of the Suez Canal it has been rapidly surpassing Calcutta in its trade. It was the American war of 1861-65 that made the fortune of B., for it then became the chief cotton mart of the globe. Its streets are thronged with people of every race, tongue, and colour. The name is a contraction of Bom Bahia, the Portuguese for 'Good Bay.' The first railway in India was opened at B. in 1853. Poonah, which stands on a table-land E. of B., is the military centre. During the mutiny of 1857 the local army on the whole remained loyal. Pop. 860,000.

Historical.—Visited by the Portuguese in 1509, and acquired by them in 1530. It was given to Charles II. as the marriage portion of the Infanta Catherine of Portugal, 1662. In 1668 it was granted to the E. India Company, who had long desired it. Confirmed by William III. in 1689.

Bombay Duck, or *Harpodon nehereus*, is a marine, pike-like fish of the family Scopelidæ. It is captured in the Indian and China Seas and exported from Bombay in a preserved state.

Bombazine is a material of which the warp is silk and the weft wool, though there is an inferior quality made of wool and cotton. The stuff is of fine texture, and is used in making the robes of some religious orders.

Its manuf. was first introduced into England by the Dutch.

Bombelli, Raffaello, Italian mathematician of the 16th century, born at Bologna, and patronised by a bishop of Melfi. His main work is a *Treatise on Algebra*, 1572, in three books, the last being a set of problems. A history of algebra is prefixed to the works, in which the invention of the science is attributed to the Hindoos.

Bombetoka Bay, a bay in the W. of Madagascar.

Bombic Acid, *see* SILK.

Bombus is the generic name for the social bees which are popularly known as humble-bees. They belong to the family Apidæ of the order Hymenoptera, and form the largest of British species. The prevailing colours are yellow, red, and black. *See* BEES.

Bombycidæ is a family of lepidopterous insects composed of small, dull moths with rudimentary maxillæ, small palpi, no proboscis, and no frenulum. *Bombyx mori* is the true silkworm (*q.v.*).

Bombycilla is a term which was formerly applied to some species of birds in the family Ampelidæ which are known as wax-wings. *B. garrulus* is the *Ampelis garrulus* of Linnæus.

Bombyliidæ, a family of dipterous insects distinguished chiefly by the long proboscis. The body is short, stout, and very hairy, and the legs are long, slender, and weak. The species are bee-like in appearance, and are remarkable for their great swiftness in flight, during which they emit a humming sound. *Bombylius major* and *B. medius* inhabit British woods and feed on nectar.

Bombyx, *see* SILK.

Bommel is a tn. in Holland belonging to the Gelderland prov., situated on the l. b. of the Waal, 7 m. S.W. of Thiel. The Bommelerwaard, a fertile is., is formed by the Maas and Waal.

Bommelo, an is. on the W. coast of Norway, situated in lat. 59° 40′ N., and long. 5° 20′ E.

Bommelwaard, an is. of the prov. of Gelderland in the Netherlands, formed by the Waal and the Maas, and containing the castle-fortress of Loevenstein. There are many small vils. on the is., as the soil is fertile.

Bomvanaland, a dist. of Cape Colony in South Africa.

Bon, Cape, the most northerly point of the coast of N. Africa. It is on the Mediterranean Sea, 58 m. N.E. of Tunis.

Bona is a seaport tn. of Algeria, belonging to the prov. of Constantine. It is situated at the base of a hill and built round by ramparts. Not much of the old tn. remains, but the new tn. is a prosperous Fr. city, in direct telegraph communication with Marseilles. Valuable marble quarries are near, and cork woods in the vicinity while a little farther off there are iron and copper mines. The manufs. are leather and tapestry. The exports are marble, iron, copper, lead, zinc, cork, tannin, and esparto. Pop. 42,934.

Bonacci, Leonardo, *see* LEONARDO OF PISA.

Bona Dea (' the good goddess '), a Rom. goddess of fertility. She has been identified with Fauna. She was the goddess of fruitfulness, both in the earth and in women. Her cult was the cult of women only, and even her name was concealed from men. From the earliest period of Roman history we have references to her worship. During the year 62 B.C. the solemnities of her festival (May 1) were performed in the house of Cæsar. The ceremonies attached to this festival were carried out exclusively by vestal virgins of high rank. All males were excluded, but on this occasion P. Clodius, disguised as a female musician, was found in the midst of the ceremony. His profanation of the mysteries of B. D. led to [illegible] was a serpent.

Bona Fides, a Lat. expression (from Lat. *bona*, good, *fides*, faith) meaning good faith. It is largely used in law, and implies a fair and just agreement with an absence of any fraudulent or unfair acting. It is used adjectively in the form ' bona fide,' and is then used in conjunction with a noun, as ' bona fide traveller,' ' bona fide purchaser.' A ' bona fide traveller,' according to law, is one who, to entitle himself to obtain refreshments at a tavern at certain prohibited times, proves to the satisfaction of the host that he, in all good faith, has journeyed from a distance that day. The term B.F. is used largely in Scotland in legal matters. According to Scottish custom, a person who buys property upon a title which he really believes to be good, although it may be bad, is protected against the consequences of this illegal position, and is entitled to retain the profits or fruits which he has reaped during his ' bona fide ' occupancy.

Bonai, the most southerly of the trib. states of Chuta-Nagpoor, Bengal. It has large timber tracks. Its area is 1297 sq. m., and its pop. 24,832.

Bonaire Island, otherwise known as Buen Aire Is., is the most easterly of the Dutch West Indian Is., situated off the N. of Venezuela, in lat. 12° 2′ N. and long. 68° 22′ W. Pop. 5000.

Bonald, Louis Gabriel Ambroise, Vicomte de (1754-1840), a Fr. philoso-

pher and politician, was born in October at Le Monna, near Millau. Being opposed to the principles of the Revolution, he emigrated, and after serving for a short time in the army of the Prince de Condé, he settled down at Heidelberg. During this period he wrote one of his most famous treatises from the ultra-Conservative point of view. He pub. this in 1796, under the title *Théorie du pouvoir politique et religieux*, and in it he prophesied the return of the Bourbons. On his return to France, he was forced to live in retirement for some time, but afterwards took part in the political life of the country, becoming first Councillor of the Imperial University. After the Restoration he became a prominent man in the affairs of state, and advocated the strongest Conservative measures, attacking all reform, and even advocating the restriction of the liberty of the press. In 1822 he became a minister, and in the following year was raised to the peerage. After the revolution of 1830 he retired from politics, and on his refusal to take the necessary oaths his peerage was taken from him. He died in November at his residence at Le Monna. He was one of the leading philosophers of the day, and based his philosophy largely on the principle of the divine origin of language. He was noted also for the purity and ornateness of his style, and for the vigour and sincerity of his utterances. Amongst the more prominent of his works are the following: *Législation Primitive*, 1802; *Recherches Philosophiques*, 1818. He had four sons, of these Louis Jacques Maurice became a cardinal of the church, 18[illegible] heir, was his works

Bona Notabilia, a legal phrase designating goods of sufficient value to be accounted for. Where a man dies leaving goods of a sufficient amount in different dioceses, in order to prevent confusion arising from double administration, the metropolitan of the prov. (in pursuance of the jurisdiction over wills which anciently belonged to the eccles. courts) grants probate or letters of administration. The value necessary to constitute property B. N. was fixed by a canon of 1603 at £5.

Bonanza is a Spanish word signifying 'fine weather at sea,' or 'success.' The term is used in the mining dists. of various countries, for a mine that yields a rich mass of ore. It was used as the name of some particular silver mines in Nevada, which for sev. years yielded great quantities of metal. The term 'in B.' is now employed for any successful business enterprise.

Bonanza Greek, Yukon, Canada, a valley with rich gold deposits, opening into the Klondyke near Dawson. The name is of Spanish derivation.

Bonaparte, Napoleon, *see* NAPOLEON I.

Bonaparte, the family name made famous by Napoleon I. In its original It. form it was Buonaparte, and in this form was retained by the whole family up to the year 1796. The family were descended from an anct. It. family who are heard of as early as the 12th century, and who seem to have settled in Corsica during some part of the 16th century. Here the family remained until after the occupation of Corsica by the English in 1793. Charles Bonaparte, the father of the famous emperor, was born in 1746, and educated in law at Pisa under the care of and at the charge of, his uncles. He seems to have been a man of somewhat rash and unsteady character, and by his early speculations endangered the fortunes of the family for some considerable time. In 1767 he married Letizia Romolina, a beautiful girl descended from an anct. Corsican family. Charles B. held sev. offices under the Crown of France in Corsica, and seems to have been naturally a schemer, for certainly it was he who pointed out that the means of a successful career were to be found for his sons not in Corsica but in France. He obtained for his second son, the great Napoleon, a place in the military school at Brienne during the period that he was resident in France as part of a deputation of Corsican nobles. In 1779 he returned to Corsica, and six years later he died at Montpelier whither he had gone for his health. His wife, Letizia, survived him for some considerable period, and saw the rise and fall of the fortunes of the family. She had been a careful and watchful guardian of the family during the days of its adversity, and when Napoleon leapt to fame and became emperor, she was rewarded with the title Madame Mére and was given a considerable household. She was, however, never at ease in it, and was always expecting the downfall of the family, so that when the fall came it did not greatly surprise her, nor was she unprepared for it. She spent the great part of her life after 1814 in Rome with her stepbrother, and died in 1836, leaving a considerable fortune, which she had taken care to save during the days of the splendour of Napoleon.

Joseph Bonaparte (1768-1844) was born in January. He was educated in France, but returned to Corsica at an early age and later studied law at Pisa. He was with the rest of the family on the democratic side as

opposed to the party of Paolo, and left Corsica when the Paolists were victorious. He spent some time immediately after this in Paris, but shortly afterwards seems to have settled in Marseilles, where he married a certain Mdlle. Julie Clary. He was continually making efforts and taking part in plans for the recovery of Corsica. In 1796 he took part with his brother in the Italian campaign, and in the following year was appointed minister at Rome, where acting on orders he did his best to stir up a revolutionary spirit. On the outbreak of the movement which led to the foundation of the Roman republic he left Rome and returned to Paris. Here he became a member of the Council of the Five Hundred, representing Corsica, but he does not appear to have distinguished himself in any way at all. He retired from this position in 1799, but during the years which followed he was of great service to the state. He helped to negotiate a treaty with the U.S.A., and was one of the representatives of France at the negotiations which led up to the treaty of Amiens in 1802. He was all this while a member of the ministry and helped also in the negotiations for the Concordat. He quarrelled with his brothers as to the selection of a successor to Napoleon when Napoleon was made First Consul for life, and this quarrel deepened in 1804 when the
was proclaimed. In 1805, dur.
absence of Napoleon, he acted
head of the gov. In the same year he proceeded to Naples at the head of the Fr. army, and in the following year he was proclaimed King of Naples. Here he was faced with enormous difficulties, bankruptcy, a corrupt nobility, and a feudal state. He did his best to act as a constitutional monarch, and drew down on his head the wrath of his greater brother for his leniency. In 1808 he was proclaimed King of Spain, but his title was purely nominal, and although he remained in Spain until 1813, he was continually being harassed both by the Eng. and by Napoleon himself. He offered to abdicate on many occasions, and although he was prepared to act as a constitutional monarch in Spain, his brother's treatment of Ferdinand VII. had done away with all hopes of his general acceptance. On the surrender of Paris in 1814 he immediately retired and played but a small part in the campaign of the Hundred Days. He did his best to further the plans for the escape of his brother, and then retired to America where he settled on the banks of the Delaware. In 1830 he attempted to get the claims of the Duke of Reichstadt (Napoleon II.) recognised by the European powers, but failed. He afterwards revisited Europe and settled down in Florence, where in 1844 he died. He left no issue. He was a man of great parts, but wholly unfitted for the rôle which he had been called on to play.

Lucien Bonaparte, Prince of Canino, was born in Corsica in 1775. He was intended for the church, for with that end in view was sent to the seminary at Aix, but his natural disposition did not easily reconcile itself to the church nor to the contemplative life, and on the outbreak of the Revolution in 1789 he threw himself heart and soul into the revolutionary movement. He became a Jacobin, and was continually urging his brothers to make plans against the Paolists in the island of Corsica. He retired to Toulon when the Paolist movement took place, and was later joined here by other members of his family. He seems to have put an end to all his hopes for some time by marrying without the consent of his family, and also when a minor. In 1794 he was for a short time imprisoned because of his too revolutionary ideas, but was released owing to the influence of Napoleon. In 1797 he refused a place offered him in the army of Egypt, preferring to attempt to enter the Council of the Five Hundred. In this attempt he was
v quickly
council.
ent, and
was able to give considerable aid to Napoleon when Napoleon overthrew the council on the 18th Brumaire
He was, how
crat, and vi
suspicion the
to gain for
dictator. During the five years that intervened between the overthrow of the council and the assumption of the imperial crown by Napoleon, affairs were very strained between the two brothers. After 1804 he became for a short time one of Napoleon's ministers, but owing to personal differences with his brother was forced to retire and was given the position of minister at the Spanish court. Here he appears to have still further annoyed his brother by the policy which he carried out there. The partition of Lisbon planned by Napoleon failed principally because Lucien refused to give his whole support to his brother's plan. He resigned his position in Madrid and returned to France, where he opposed the policy of his brother. He gave further offence in 1803 by marrying the widow of a stockbroker and publicly bestowing on her the

name of Bonaparte. He was therefore ordered to leave Fr. ter. and retired to Italy. In 1807 he was offered the kingdoms of Naples and Spain on condition that he renounced his wife. This he refused to do. He took the papal title of Prince of Canino. He attempted to reach America, but was captured by the Eng. and brought back to England, where he remained until 1814. During the Hundred Days he offered help to Napoleon, and seems to have been the only member of the family who remained cool under the stress of the period. After 1815 he spent the remainder of his life in Italy, dying in June 1840. He left issue, four sons and six daughters. He was to a very great extent the 'fire-brand' of the family.

Louis Bonaparte (1778-1846) was born in Corsica in September. His famous brother Napoleon supervised the greater part of his education, and, indeed, seems to have made considerable sacrifices for him. He acted as aide-de-camp for Napoleon during the It. campaign, having received a military education at Brienne, and was again with Napoleon during the Egyptian campaign. He was married in 1802 to Napoleon's stepdaughter, the beautiful and accomplished Hortense Beauharnais, a marriage which was very unhappy He received still further advancements at the hands of his brother, becoming successively a general and governor of Paris. In 1806, in pursuance of his general policy, Napoleon made him King of Holland. From the very outset his policy seems to have displeased Napoleon, and his attempts to become popular and to govern liberally added to this displeasure. His failure to prevent a huge smuggling trade from going on with England, and the increasing rigour of the continental system, led to a violent quarrel between the two brothers. In 1808 he was offered the crown of Spain but he refused it, and as a consequence it was given to Joseph. By 1809, Napoleon had resolved that his control of Holland should become real, and in 1810 Louis fled the country and went into exile in Bohemia, his kingdom being actually annexed by Napoleon. For the rest of his life after 1815 Louis lived chiefly at Rome, where he took a great pleasure in literary and philosophic studies. The career of his sons was also one of his chief concerns, and he was delighted by the part which they played in the revolution of 1830 in Italy. This pleasure was clouded, however, by the death of his eldest son. The failure of his second son, Louis Napoleon, to obtain the crown of France was a great disappointment to him. He died in 1846. His literary works, which occupied chiefly his later years, are unimportant. His sons were: Napoleon Charles (*d.* 1807), Napoleon Louis (*d.* 1831), and Charles Louis Napoleon (Napoleon III., *d.* 1873).

Jerome Bonaparte, youngest brother of Napoleon, born in Corsica in Nov. 1784, was educated in the college at Juilly, and took part in the family fortunes during the Revolutionary period. He served in the navy as a lieutenant, and on the outbreak of war with England in 1803 he was cruising off the W. Indies. He travelled through the U.S., and here, although a minor, he married a Miss Patterson, the daughter of a Baltimore merchant. His marriage was very displeasing to Napoleon, who forbade her entrance into any of the French states, and later declared the marriage void, although it was legal in America and was never declared void by the pope. He again took part in the expedition of the navy, and on his return in 1806 was made a prince of France. He took part in the Ger. campaign of 1806, and was by the treaty of Tilsit (1807) made King of Westphalia. He was an exceedingly extravagant and licentious ruler, and was frequently rebuked by Napoleon for his excesses. Ultimately he was practically placed under the control of one of the Fr. marshals. After the downfall of Fr. power in Germany he retired to France, and afterwards to Switzerland. In 1815 he helped Napoleon at the Battle of Waterloo, commanding a part of the Fr. left wing, and showing great valour in his attack on Hougomont. After 1815 he lived principally in Italy and Switzerland until 1848, when on the accession of his nephew, Louis Napoleon III., he came back to France and occupied some high state positions until in June 1860 he died.

Marianne Elise Bonaparte (1777-1820) was born in Corsica in January. She was educated at St. Cyr, but shortly after the outbreak of the Revolution returned to Corsica. In 1797 she married Felix Bacciochi, a wealthy Corsican. She was, however, ambitious, and Napoleon gave her the principality of Lucca. In 1808 she received the grand duchy of Tuscany, and was an important influence in It. politics. Her relations with Napoleon were frequently strained. After 1815 she retired first to Italy and then to Austria, where she died near Trieste in 1820.

Marie Pauline Bonaparte (1780-1825), was born in Corsica in October. At the age of seventeen she married General Leclerc, who died in 1802. In 1803 she married Prince Camillo

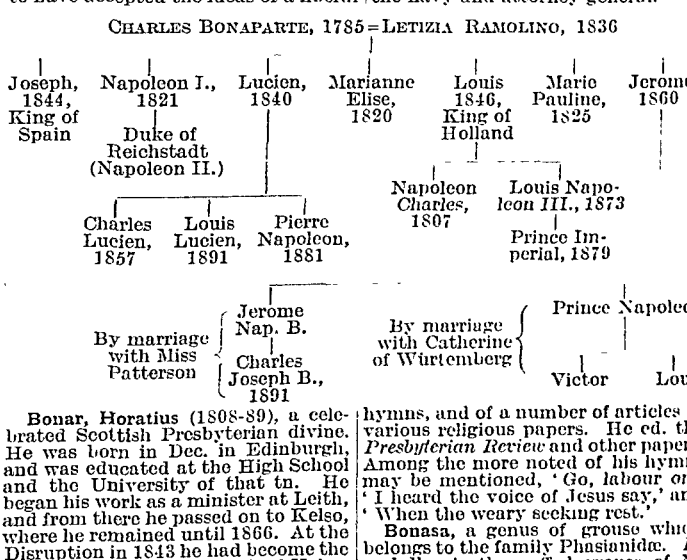
Borghese, and went to live in Rome. She soon, however, returned to Paris, where the manner of her life caused great scandal. In 1806 she was made a duchess. In 1814 she retired to Elba with her mother. She seems to have been devoted to her brother Napoleon, and even offered to share in his exile. She died in 1825.

Of the other descendants of the Napoleonic family the more important are:—The three sons of Lucien, Charles Lucien, Louis Lucien, and Pierre Napoleon. The former took practically no place in politics, but estab. himself as a scientist. The second, after playing at politics during the regime of his cousin, after 1848 estab. some considerable claim to fame as a philologist; whilst the third, who spent the greater part of his life in political work of some description, led an otherwise very licentious life, and died in 1881, practically unknown. He left two children.

Napoleon Joseph Charles Paul, the second son of Jerome, King of Westphalia. Took an active part in the restored empire of 1848. He seems to have accepted the ideas of a liberal empire, and disagreed with much of the policy of Louis Napoleon III. After the death of the Prince Imperial he became the head of the Imperialists. He was, however, in this position not very successful, and was deposed in [illegible] at Rome 1891.

Louis (1856- [illegible] Napoleon III. He was always delicate, but took part in the early part of the Franco-Prussian War, later coming with his mother, the Empress Eugenie, to England, where they settled down at Chislehurst. He was recognised as Napoleon IV. by the Imperialists on the death of his father. He volunteered for service with the English during the Zulu campaign, and was killed during that campaign on June 1, 1879. He was buried at Chislehurst.

The American line, the descendants of the marriage of Jerome and Miss Pattersen, have had at least one distinguished descendant in the person of Charles Joseph Bonaparte, grandson of Jerome, King of Westphalia, who has filled many public offices in America, and has been secretary for the navy and attorney-general.



Bonar, Horatius (1808-89), a celebrated Scottish Presbyterian divine. He was born in Dec. in Edinburgh, and was educated at the High School and the University of that tn. He began his work as a minister at Leith, and from there he passed on to Kelso, where he remained until 1866. At the Disruption in 1843 he had become the minister of the Free Church of Kelso, and from here he passed on to the Chalmers' Memorial Church in Edinburgh. He was made D.D. in 1853 by the university of Aberdeen, and in 1883 he was moderator of the General Assembly. He died on the last day of July. He was the writer of many hymns, and of a number of articles in various religious papers. He ed. the *Presbyterian Review* and other papers. Among the more noted of his hymns may be mentioned, 'Go, *labour on*,' 'I heard the voice of Jesus say,' and 'When the weary seeking rest.'

Bonasa, a genus of grouse which belongs to the family Phasianidæ. *B. umbellus* is the ruffed grouse of N. America, which is characterised by the absence of feathers on the toes and lower part of the legs, the long rounded tail, crested head, and the ruff on its neck. *B. sylvestris* is the hazel grouse.

Bonasoni, Giulio (*c.* 1540–72), an

Italian painter and engraver, born at Bologna; studied under Sabbatini. His reproductive work, which was done almost entirely with the graver, includes prints after Michael Angelo, Raphael, Titian, Giulio Romano, and Parmegiano. His original paintings were mainly for churches, one of the best being on the subject of purgatory.

Bonasus, the name of the European species of bison (*q.v.*).

Bonaventura, St. (1221-74), a famous Franciscan theologian, born at Bagnorea in Tuscany. His real name was John of Troanza. He was destined for the church from his youth, and in 1243 he entered the Franciscan order. He studied at Paris, where in 1253 he became a teacher, succeeding his own master, John of Rochelle. In 1255 he became a doctor, and in the following year he was selected general of his order. On the death of Clement IV. it was his influence which patched up the quarrel of the cardinals and led to the election of Gregory X., who rewarded him with the red hat of a cardinal and the bishopric of Albano. The same pope insisted upon his attendance at the Council of Lyons, where he died a martyr to his own asceticism. He was popularly regarded as a saint before his death, but was formally canonised by Sixtus IV. in 1482, and ranked as sixth amongst the doctors of the church by Sixtus V. in 1587. Dante places him amongst the saints in his *Paradiso*. His works were devoted to a very great extent to the defence and praise of his order, but as a philosopher his doctrines are in marked contrast to those of Thomas Aquinas and Roger Bacon. The purely intellectual was never to him in as high a plane as the power of the affections and the heart. He condemns very severely the Aristotelian doctrine of the eternity of the world. The warmth of his style and his great religious fervour gained for him the title of Doctor Seraphicus. Amongst his chief works may be mentioned *Itinerarium Mentis ad Deum*, *Breviloquium*, *De Reductione Artium ad Theologiam*, and *De Septem Utineribus Aeternitatis*. Amongst the eds. of his works are: Rome, 1588-96; Lyons, 1668; Venice, 1751; Rome, 1882-92.

Bona Vista is the name of a tn., a bay, and a cape in Newfoundland. The tn. is one of the oldest on the is., and is also a port. Its pop. is 3500. The cape is on the E. coast, and has an alt. of 150 ft., upon which is a lighthouse with a revolving light. The bay is 30 miles wide.

Bond, in law, a deed, *i.e.* a document under seal, by which one party, the 'obligor,' binds himself to perform or refrain from performing some act, under a penalty if he fail, to be paid to the other party, the 'obligee;' the B. to be void on the performance of the act or the payment of the penalty. If the B. is for the payment of money, the condition in the B. usually is that the B. shall become void if the obligor pays to the obligee a smaller sum, generally one half of the sum named in the B., together with interest. A B. runs for twenty years, and action on the B. is barred after that period. If the B. is for the refraining from doing a specific act, the payment of the penalty alone will not be sufficient, the obligor must not continue in the act, *e.g.* of service with another firm. The Bs. of a limited company are debentures, to be repayed at a fixed period, or from a sinking fund. Other Bs. are 'bottomry Bs.' for sums advanced for the continuance of a voyage, secured on the ship, to be repaid on safe arrival. Bs. given by holders of confidential posts are generally known as guarantees.

Bond, Sir Edward Augustus (1815-98), Eng. librarian, was born at Hanwell on Dec. 30, being the son of a schoolmaster. He was educated at the Merchant Taylors' School, and in 1832 obtained a post at the Public Records Office. Six years later he became an assistant librarian of the MSS. dept. of the British Museum. Here he attracted the favourable notice of his chief, and received rapid promotion. In 1867 he became keeper of the MSS., and eleven years later he became prin. librarian. To him are due a number of the reforms and improved efficiency of sev. depts. in the British Museum. He ed. 4 vols. of facsimiles of A.-S. charters, and also published *The Speeches of the Trial of Warren Hastings*. He was knighted on Jan. 1, 1898, and died on the following day.

Bond, The Rt. Hon. Sir Robert, P.C., K.C.M.G., LL.D. (*b.* 1857). He was born at St. John's, Newfoundland, to which place his father, John B., had moved from Torquay. He entered the legislature in 1882, and two years later was elected Speaker of the House of Assembly. In 1889 he became Colonial Secretary, and in 1890 he was appointed a delegate to the British government on the question of the French treaties. In the same year he assisted Lord Pauncefote in his negotiations with the U.S.A. for a reciprocity treaty, and was largely responsible for the completion of the Bond-Blaine Convention. He was sent as a delegate by the government to Halifax, on the N. American fisheries question, in 1892, and in 1895 to the Ottawa Conference, as chairman of the delegation. In 1900 he was appointed premier, and in

1902 completed the Hay-Bond Treaty with the U.S.A. He has received many public and municipal honours.

Bond, William Cranch (1789-1859), a celebrated astronomer of America. He was born at Portland, Maine, in September, and became a watchmaker. He erected a private observatory, and was one of the exploring party who went to the South Seas with an American expedition in 1838. On his return he was made the director of the observatory at Harvard University, and whilst holding that position he discovered a satellite of Neptune and an eighth satellite of Saturn. He died in January.

Bondager System, The, which exists on the borderland between England and Scotland, arose out of the difficulty of obtaining field labour among a rural population. The word 'bondager' is applied to the woman who undertakes the tenancy of a farm-hand's cot-house, on condition that he gives her regular field work. The 'bondager' is often a member of the labourer's family.

Bonde (Old Norse *buandi*, inhabitant) is a term meaning a member of the peasant class. This class used to

Bonded Warehouse is a store approved by the revenue or custom authorities in which goods that have been imported and are subject to duty are stored until the bonder withdraws them for exportation or pays the duty. Previous to the establishment of these places in England, the payment of the duties had to be settled immediately on importation. This system had many serious drawbacks, and one of the chief was that the prices of goods were raised in order that the large duties could be paid. In 1733 the first move was made towards the B.W. scheme by Sir Robert Walpole, but it was in 1803 when the system was finally adopted.

Bondeno, a tn. of Italy, situated to the W.N.W. of Ferrara, from which it is 11 m. distant. Pop. 13,544.

Bondi, Clemente (1742–1821), an It. poet who was born in Mezzano. He was educated by the Jesuits, and at an early age became a lecturer at the Royal Convent at Parma. He offended the Jesuits by a poem which he wrote celebrating their abolition, and was forced for some time to live in exile. He later settled at Milan, where he wrote a number of poems under the protection of the Archduke Ferdinand. He died at Vienna on June 20.

Bondu is a Fr. protectorate in W. Africa. It is situated between the R. Faleme, and the upper course of the Gambia. It is hilly in the centre and S., but generally fertile, having fine forests and valuable fruit trees. It is well cultivated, the chief products being rice, grain, fruits, melons, cucumbers, tobacco, cotton. The Foulahs are the prin. inhab., and their religion is Mohammedanism. Pop. 1,500,000.

Bonduku, a town of W. Africa, in the Fr. colony of the Ivory Coast, situated in 7° 45′ N. lat. It was placed under French protection by Captain Berger in 1888. Gold dust is the prin. object of commerce. Pop. 3000.

Bondy, a Fr. vil. in the dept. of Seine, in the arron. of, and 6 m. from, Saint Denis. It manufs. ammonia and has a trade in cheese. Pop. 4500.

Bone, the hard tissue that constitutes the skeleton or framework of the body. This framework serves to support some structures as a central core, and to protect others as a surrounding casing. The different parts of the framework are articulated or jointed with each other and are converted into levers by which a great number of movements can take place through the instrumentality of muscles. Bs. are of various shapes, according to the functions they fulfil. Long Bs., of cylindrical form, are characteristic of the limbs; flat Bs., with a certain amount of curvature, are characteristic of protective Bs.; short Bs. are characteristic of the wrist and instep: while such Bs. as the vertebræ and those of the face are somewhat more irregular in form. The total number varies according to age, as may Bs. which are separated in infancy become fused as time progresses, and certain small Bs. are frequently developed in some individuals late in life. There are, however, 206 distinct Bs. in the ordinary adult. The functions and dispositions of the Bs. will be dealt with in the articles on SKELETON, SKULL, ARM, etc. Human B. consists of about 31 per cent. of organic matter, and about 69 per cent. of mineral salts, of which calcium phosphate forms the greater part, being 58 per cent. of the whole bone matter. The animal matter may be removed by boiling or charring. When the mineral matter only is left, the B. appears hard and brittle. The mineral salts may be dissolved out by treating the B. with acid, when a jelly-like substance remains, preserving the shape of the B., but possessing none of its characteristic hardness. Thus the combination of animal and mineral substances serves to produce a substance which is at once hard, tough, and elastic. The qualities of B. as a useful substance in itself have been recognised in the arts. It is stronger than oak, can withstand a

tremendous crushing strain, and yet is so elastic that savages have used the ribs of large animals for making bows. An examination of a fresh B. shows it to be covered with a strongly-adhering membrane, which is called the *periosteum*. Underneath this the B. appears as a hard compact mass, gradually decreasing in hardness towards the axis, so that the inner part of the B. is of a spongy nature, while in certain situations there is a cavity, often filled with marrow, in the interior. In curved Bs. there is a thickening of the hard compact portion on the concave side, where the greatest strain occurs. The B. is thus most economically constructed, the greatest strength and elasticity being combined with lightness of material. All Bs. are provided with channels by which the nourishing elements in the blood may penetrate to the interior, while the vessels of the periosteum enter the surface by many fine arteries. Inflammation of B. is called *Ostitis*, or *Osteitis*. It is due to the microbe *Staphylococcus pyogenes aureus*. The germs enter with the blood stream, and owing to the dense and compact nature of the B. tissue, they may find a lodgment there, multiply, and form masses of pus. The part of the B. most likely to be affected is the newly growing portion between the main shaft and the cartilaginous end. The symptoms unfortunately are not very definite at first, pains akin to rheumatism being felt at the joints, and ultimately a sensation of tenderness develops in the B. itself and the temperature increases. Surgical measures only are possible; an incision is made into the B., and the diseased part scraped out. No mistake must be made about getting rid of the affected matter, it is better to sacrifice some healthy tissue than allow any trace of the disease to remain. The cavity, of course, must be thoroughly disinfected. In *Condensing Ostitis* the medullary cavity is filled with a dense bony mass, and new B. appears on the surface, so that the B. becomes heavier than normal. Bs. are liable to fracture by direct violence as in concussion, or indirect violence as from too great a strain. The fracture may be simple, when the B. is broken into two pieces; or compound, when the B. is crushed, or broken in several pieces. The treatment aims at 'setting' the B., or placing and keeping the broken ends in such a position that the natural healing powers of the B. tissues may bring about a fusion. It is desirable, of course, that when the fracture is healed there should be no avoidable shortening or stiffness of the limb. Careful adjustment in the first place, constant inspection during treatment, and the earliest possible movement of the limb are necessary to a complete and successful healing of the fracture.

Bone, Henry (1755-1834), an Eng. enamel painter, was born in Cornwall, apprenticed at Plymouth, and afterwards worked at the Bristol china works until they failed. He then came to London, and soon gained a reputation. He was named enamel-painter to George III. in 1801, and elected an associate of the Royal Academy, and a member in 1811. His works are now eagerly looked for by connoisseurs; the best known are the 'Death of Dido,' and 'Bacchus and Ariadne.'

Bone, Muirhead (*b.* 1876), etcher and painter, studied at the Evening School of Art in Glasgow, and came to London in 1901. He is a member both of New English Art Club and the Society of Twelve.

Bone-ash, the white ash that remains when bones are burnt. Bones are usually boiled to remove the fat and glue-forming substances and the remainder is burnt. The ash consists of tricalcium phosphate, and is used as a manure, in the manufacture of superphosphates, and in the manufacture of porcelain.

Bone Beds are strata or deposits of bones found on land or beneath the sea. The term is applied sometimes to the stalagmites on cave floors when they contain remains of bones. These B. B. are really thin layers of the remains of bones of reptiles, fishes, and mammals, occurring in certain places. At Ludlow, for example, there is a B. B. stretching for many miles. There are some also in the S.W. of England, and similar ones in Germany. The Rhætic B. B.—so called from deposits found at first near the Rhætian Alps—form part of the Triassic System. There is a B. B. under the sea near the Faroe Is., and this contains shells mixed with the bones.

Bone-black, or animal charcoal, is obtained by the dry distillation of bones. When the fat and gelatines have been removed from the bones the remainder is heated in closed retorts. The product is about one-tenth charcoal, the remainder being calcium and magnesium phosphates and other mineral salts. It has been used in sugar-refining for decolourising syrups.

Bonellia is a genus of annelid of the class Echiuroidea. It has an oval body, green in colour, with a long proboscis which is bifurcated, and a long intestine. *B. viridis* burrows in the sand of the North Sea.

Bone Manure, a general name for fertilising agents in which powdered

bones, or substances derived from bones, are present. The most important mineral element which has to be supplied to cultivated soil is phosphorus. Phosphates appear to be associated with the reproducing powers of plants, and where they are in abundance the process of maturing is hastened, and the germinating part of the plant is well developed. The value of bone as a phosphorus-supplying manure was realised by Liebig in 1840, and at the experimental farm of Sir John Lawes at Rothamsted in 1843 the possibilities of artificial phosphates were investigated. The bones were dissolved in sulphuric acid to obtain the calcium superphosphate, which was soon found to be of the highest value as a manure. The superphosphate is usually mixed with powdered bones in varying proportions to suit the nature of the soil and the particular crops intended. Ordinary bones contain nearly 50 per cent. of calcium phosphate, and when ground make an excellent manure. The phosphate is, however, somewhat slow in its action, and although it enriches the soil for years, it is better to mix a suitable proportion of the more rapidly acting superphosphate.

Bone Oil, a fetid, blackish-brown, thick liquid obtained by dry distillation of bone, or by heating them with water and by use of solvents. Extracted also in preparation of bone-black, and used in soap-making. Contains ammonia, sulphuretted hydrogen, pyrrol, etc. Dippel's oil, an animal oil produced by distillation of stags' horns, is used as medicine.

Boner, Charles (1815-70), author, born near Bath. In 1831 he became tutor, for about six years, to the two sons of Constable, the painter. Soon after he visited Germany and entered, as tutor, the family of Prince Thurn und Taxis at S. Emerau. During this period, when on a visit to England, he became acquainted with Miss Mitford. From 1800 and onwards he lived at Munich, but went to Vienna in 1865, for a time, as special correspondent to the *Daily News*. Among his works are: *Chamois Hunting in the Mountains of Bavaria*, 1853; translation of *A Danish Story-book* by H. C. Anderson, 1846. See *Memoirs and Letters of C. Boner*, 1871.

Boner, Ulrich, a celebrated Ger. writer of fables who *fl.* during the 14th century. He was born at Bern, and was descended from a famous Bernese family. He probably took clerical orders and became a friar. His name is of frequent occurrence between the dates 1324-49. In 1461 his book of 100 fables was printed at Bamberg. He wrote in middle high Ger., and has some claims to originality and style.

Bone-setter, a surgical operator, usually without the customary qualifications, who attempts by manipulation to restore mobility to stiffened joints, etc. Joints become stiffened usually as the result of inflammation, which causes osseous solidification of the joint, or destroys the synovial membrane, or so far weakens and renders useless the ligaments and cartilages that movement is impossible. It has long been known that in some cases mobility can be attained by forcibly breaking down the adhesions; and by keeping up systematic movements the tissues can be encouraged to adapt themselves to the mobile condition. Some striking successes obtained by unqualified practitioners in dealing with obstinate cases have tended to arouse public enthusiasm in certain advocates of 'bloodless surgery.' The defence of the orthodox surgeon however is, that he prefers to investigate thoroughly the causes of immobility rather than to trust to somewhat violent measures which in certain conditions of the joint are certain to do irreparable damage.

Bonet, Juan Pablo (*c.* 1590-1630), Spanish philanthropist, who in 1620 pub. at Madrid a work on the instruction of deaf-mutes. His method, which was probably largely that of Pedro Ponce de Leon (*c.* 1520-84), corresponds to what is now known as the 'combined system,' *i.e.*, he used phonetics as well as the manual alphabet. He taught the meaning of nouns by pointing, verbs by action, and the other parts of speech by continual use. Sir Kenelm Digby, who met him at Madrid, states that his methods were most successful. He instructed a brother of the Constable of Castile, in whose service he was

Bonet, or Bonnet, Theophilus (1620-89), Swiss physician, born at Geneva; took his degree in medicine in 1613, and practised in Geneva with great success till about ten years before his death, when, having become deaf, he relinquished practical work for writing. He is best known as having been a pioneer in the science of pathological anatomy, but he also wrote numerous valuable treatises on different branches of medicine and surgery. His chief works were *Labyrinthus Medicus Extricatus*, and *Sepulchretum Anatomicum seu Anatomia Practica*, 1679. Of this last, a corrected ed. by Mauget was issued in 1700. *See* Nicéron's *Mémoires*.

Bonfadio, Jacopo, Italian philosopher and historian of 16th century, born at Gorzano, near Salo; educated at Verona and Padua; in 1535 became private secretary to Cardinal Ghinucci at Rome. After leav-

ing the latter, he travelled through Italy for several years, and in 1545 became professor of philosophy at Genoa, of which city he wrote a history, *Annales Genovenses*, 1528-50. He was executed on a somewhat doubtful charge in 1550. His other works include letters, poems, and a translation of Cicero's *Oratio pro Milone*, all of considerable merit.

Bonfire (Early Eng. *bonefire*; Scottish *baneure*), in its original meaning a fire for burning bones, now used to designate any fire which is lit in the open air; usually on an occasion of national rejoicing. The derivation of the word has been the subject of some considerable dispute, but most of the derivations of it are now rejected in favour of the one given above. Although the meaning which attaches to it now is that of a fire burnt in the open on some open space or hill top on an occasion of national rejoicing, yet the other meanings of the word are still maintained, and the word bonfire is applied equally to a fire for burning bones, a funeral pyre, or a fire in which heretics are burnt. The origin of the lighting of these fires seems undoubtedly to be pagan, since the early Church did its best to stop the habit of lighting fires, which were described as of heathen origin. But it is necessary not to overlook the fact that the early Christian Church adopted the custom of lighting Bs. on sev. Christian festivals in order to make compromise with the heathen. The peasantry of Europe all keep the custom of lighting Bs. on special occasions during the year. In many countries St. John's Eve and St. Peter's Day are celebrated in this way. The greatest 'B. day' in England is the 5th of Nov., the annual celebration of the escape in 1605 of the king and the legislature.

Bonga, cap. tn. of Raffa, Abyssinia, 340 m. S.W. of Debra Tabor. An important trading centre.

Bongar is a name given to the genus *Bungarus*, poisonous snakes in the family Colubridæ. *B. candidus*, the krait, is common to India, and though only about four feet in length it is a very deadly reptile.

Bongardia is the name of a genus of the order Berberidaceæ which grows in the East. The leaves of *B. chrysogonum* are eaten as salad, and the tubers of *B. Ranwolfi* are also edible.

Bon Gaultier Ballads is the name of a book of parodies on modern poetry. 'Bon Gaultier' was the *nom-de-plume* of Sir Theodore Martin (1816-1909) as a contributor to *Fraser's Magazine* and *Tait's Magazine*. In 1856, in conjunction with Professor W. E. Aytoun, he pub. a *Book of Ballads*, by Bon Gaultier, which proved very popular.

Bonghi, Ruggero (1828-95), an It. author and statesman, born at Naples. He had to leave that city after 1848 and go to Tuscany, whence he was exiled, but in 1859 he became a professor at the university of Pavia. In 1860 he returned to Naples, and some years after became Minister for Public Instruction, instituting many reforms while he was in office. During this time he wrote for sev. reviews, among them *La Perseveranza*, and his writings are characterised by their sharp and sometimes bitter criticism upon friends and enemies alike. Among his works are *A translation of the Dialogues of Plato*, 1880, and *Storia di Roma*, 1884.

Bongo are a negro tribe who occupy the land in the basin of the Bahr-el-Ghazel, Eastern Soudan. They were formerly subjects of, and have been enslaved by, the Mahdists. They number only about 100,000, and they are medium in stature and of a bronze colouring. They are clever in iron smelting, etc., which metal is used in coinage.

Bonham, a vil. in Texas, cap. of the co. of Fannin. It is situated on Bois d'Arc Creek, and has a pop. of 3400.

Bonheur, Rosalie Marie, usually called **Rosa** (1822-99), was born at Bordeaux in March. She was descended from a family of Swedish origin and also a family of considerable artistic talent, both her brothers and her sister gaining a certain amount of fame as artists. Her first instructor seems to have been her father, who was an artist of no little merit. She exhibited between the years 1841-45 at the Salon; in 1848 she was awarded a medal. She had rapidly come to the front as a painter of animals. Her study of living animals and her faithful representation of them are the chief reasons for her success. In her paintings the anatomy of the animals is always perfectly correct. Her international fame dates from her exhibition of painting in 1855. She received the decoration of the Legion of Honour and afterwards became an officer of the same order. After 1867 she only exhibited once at the Salon, in 1899, shortly before her death. Among her more famous pictures may be mentioned: 'Ploughing in the Nivernais,' 1848, at Luxembourg; 'The Horse Fair,' 1853, in United States, a replica in the National Gallery; 'Hay Harvest in Auvergne,' 1865.

Bonhill, a vil. of Scotland in the co. of Dumbarton and 3 m. N. of that tn. It is the bp. of Smollett. Pop. 2510.

Boni, a state in the S. of the Is. of Celebes, belonging to the Dutch E. Indies. It is about 860 sq. m. in area.

The inhab. are called Bugis, and they have a language similar to that spoken by the Macassars. They pursue agric. occupations, and manuf. a cotton cloth, also trading in pearls, gold dust, nutmegs, camphor, etc. The chief tn. is B., situated on the Macassar peninsula, and is bounded by the Gulf of Boni on the East.

Boniface. In George Farquhar's comedy, *The Beaux Stratagem*, 1707, the landlord of Lichfield was named B., and so this name came to be applied to innkeepers generally.

Boniface, St., the apostle of Germany, was born about the year 680 at Crediton in Devonshire. He received a good education for the time, in England, and distinguished himself both by his scholarship and by his ability as a preacher. Rejecting all inducements to remain in England, he became a missionary to Frisia, following the example of many other Saxon monks. His first mission, owing to the opposition of the king, was not successful, but after he had received a direct commission from the pope he set out for Thuringia, but was recalled to Frisia by the death of the king who had opposed him. Here he worked for some years under the direction of the Bishop of Utrecht (Willebard) and met with great success. So great, indeed, was his success that he was consecrated bishop and received special letters of recommendation to Charles Martel. The protection of the Carlovingian made his success possible, as he himself owns, and he now started upon a [illegible] against heathenrting, and breakof the heathen. From England he called his great band of missionaries whose aid was so essential to his success. In 732 he was made an archbishop. Later he was charged with the reorganisation of the whole Frankish church, and threw his whole soul into the work before him. He depended upon the support of Carlanan and Pippin, and was able to call together the first Ger. council of the church. He divided Germany into bishopries as he had already done in Bavaria. He had two great controversies, one with the Irish monk Virgil, the other with a Neustrian bishop who gave utterance, according to B., to many heresies and who was condemned in 744 with the aid of Pippin. B. now became bishop of Mainz and metropolitan of Germany. The national church probably at his instigation gave its submission to the Rom. see. In 754 he resigned his see and again took up his mission to Frisia, where in the same year he and his companions were assassinated by the heathen they had come to convert. The life work of B. left its mark upon the organisation of the Ger. Church, and while he is not famous as a literary man, there remain to us many of his letters and writings.

Boniface, the *name* of *nine* popes:

Boniface I., bishop of Rome from 418-422, was elected in the face of some opposition, but recognised by the imperial gov. owing to a breach of faith by his opponents. This recognition, however, did not end the opposition to him, and there was for some considerable time opposition from his rival's faction.

Boniface II. (530-532), by birth a Goth, and bishop of Rome by favour of the Gothic king and the nomination of his predecessor, Felix IV. He only ruled for two years. During this short period he attempted to establish the precedent by which he had become pope, but failed in his endeavour to nominate his successor.

Boniface III. was pope for about nine months during the year 606. He was recognised as the 'head of the church at Rome.'

Boniface IV. (608-615) converted the Pantheon at Rome into a Christian church.

Boniface V. (619-625) is quoted as doing much to help in the Christianisation of England. Bede quotes him as writing letters to various of the political authorities in England. He is supposed definitely to have fixed upon Canterbury as the metropolitan see of England, although Augustine had intended London to become so after his (Augustine's) death.

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papal throne in the room of Benedict VI. who had been assassinated. After a very stormy career, he managed to return to Rome from which he had been driven, threw Pope John XIV. into prison, and remained as pontiff from 984-985, not quite a year.

Boniface VIII., the most famous of the popes, was born of noble family, and studied canon and civil law in Italy and France. He took part in sev. of the stormy incidents in the career of Henry III. in his quarrel with the barons and people. He became of great importance in the Rom. Church, and in 1294 he succeeded Celestine V. as pope. His papacy was in great contrast to that of his predecessor. He asserted to the full the spiritual and secular claims of the papacy. By most of the Fr. clergy he was disliked and his policy raised up for him a number of other enemies. The attempt to humble Edward I. failed, but previous to this he had issued the Bull *clericos laicos* which

led to the outlawry of the clergy in England. The Fr. vice-chancellor was sent to arrest him in order that he should be deposed by a universal council. He was ultimately captured at Agnagi and taken to the Vatican, where he was imprisoned and died, probably at the age of about seventy, 1303.

Boniface IX. (1389-1404), born at Naples of anct. but poor family. He was made a cardinal by Pope Urban VI., whom he succeeded on the papal throne. He won back the greater part of the papal states to the allegiance of the papal throne and abolished the republic in Rome. He was, for the time, a man of good morals, but has been justly accused of selling offices and of nepotism.

Boniface of Savoy, English archbishop of Canterbury, 1244-50, son of a count of Savoy and uncle to Henry III.'s wife, Eleanor. B. entered the Carthusian Order, became bishop of Belley, near Chambery, 1234. His promotion to the see of Canterbury proved so distasteful to all parties in England that he withdrew to Rome in disgust, 1250-2; 1255 B. set out to relieve his brother Thomas, imprisoned for tyranny by the people of Turin; 1256 he took part with bishops against the king and pope; 1263 joined papal legate in excommunicating the rebellious barons. He died 1270, while accompanying Edward I. on a crusade. Consult Stubbs' *Registrum Sacrum Anglicanum*, 1858; Le Neve's *Fasti*, 1854; Rose's *New General Biog. Dict.*, 1848.

Bonifacio is the name of a strait separating Corsica and Sardinia. It is 7 m. wide, but navigation is rendered difficult by the numerous small is. The tn. of B., a port, is situated in Corsica on a peninsula. It is difficult to reach, because the harbour entrance is narrow. Exports are oil and wine, and coral fishing is one of the chief industries. Pop. 4235.

Bonillo, a tn. of Spain, 34 m. W.N.W. of Albacete; pop. about 5050.

Bonin Islands are is. groups situated in the N. Pacific Ocean, lat. 26° N., long. 143° E., 700 m. S.S.E. from Japan. They number about twenty, but ten only of them are of any considerable size. They have been divided into three groups: the northern group are called the Parry Islands, and those in the centre the Beechey Islands, while the southern group are the Bailey or Coffin Islands. The whole of them are of volcanic origin. They were discovered in 1639 by Quast and Tasman. In 1827 Captain Beechey visited them, and took possession of them for Britain, and in 1878 the Japanese reclaimed them. Port Lloyd is the chief port. Pop. 1500.

Bonington, Richard Parkes (1801-28), an Eng. artist, was born at Arnold in Nottinghamshire; his family removed in 1816 to Paris, where he was entered as a student of the Royal Institute of France. He studied under Louis Francia and Baron Gros. In 1822 he began to exhibit at the Salon, and in 1824 gained a medal there. In 1825 he began painting in oil; all his pictures are distinguished by the purity and brilliancy of their colouring. He came to England and exhibited sev. pictures at the Royal Academy. He had undoubtedly a brilliant career before him, but caught an attack of brain fever from exposure to the sun while sketching; he fell into a decline, and came to London for medical advice, and died there. The Wallace Collection has a large number of his works, both in water colours and oils; the National Gallery has one, and the South Kensington Museum two, and some drawings.

Bonito is the popular name of the *Thynnus pelamys*, an acanthopterygious fish of the family Scombridæ. It belongs to the same genus as the tunny and is allied to the mackerel. The flying-fish serves as its food.

Bonivard, François (*c.* 1495-1570), 'the famous prisoner of Chillon' of Byron's poem. He was born at Seyssel, being descended from an old noble family of Savoy. He succeeded his uncle as prior of the Cluniac priory of St. Victor in 1510. Resisting the encroachments of the Duke of Savoy, he was arrested and imprisoned. His first imprisonment only lasted for about two years, at the end of which time he was released. But he still remained a great antagonist of the duke, and in 1530 he was again arrested and imprisoned. This was the famous imprisonment during which he spent some four years underground, and was only released in 1536 by the seizure of the castle by the Bernese, who had revolted and won back Vaud from the duke. The details of his imprisonment as we have them from Byron owe a considerable amount to the imagination of the poet. He became a Protestant shortly after his release, and received a pension from Geneva. He was appointed in 1542 to write an official history of Geneva, and his *Chroniques de Genève* were written between this time and his death, although they were not published until 1831.

Bonjem, a small tn. in the valley of Tripoli, N. Africa, situated 150 m. to the N. of Sokna. It is situated in an oasis, and has Rom. antiquities and ruins.

Bonn, a city of the Prussian prov. of Rhineland, situated on the l. b. of the Rhine, 21 m. S.S.E. of Cologne

The city has a pleasant situation, and has been much improved of late years, though the old quarter is still distinguished by narrow, irregular streets. The cathedral, which dates from the 13th century, is cruciform in plan, and is a fine example of the late Romanesque style of architecture. The university, which was instituted in 1818 by the King of Prussia, is a very fine one, and accommodates nearly 3000 students. Other noteworthy buildings are the museum of the Academy of Arts; the provincial and municipal museums; Beethoven's house, which has been converted into a museum since 1889; the castle of Poppelsdorf; and the bridge across the Rhine, 1417 ft. in length. B. is an episcopal see of the old Catholics. It was called Castra Bonnensia in the time of the Roms., and was one of the most important Rom. camps on the Rhine. After being almost destroyed in 1689 by the Elector Frederick III. of Brandenburg, it underwent a siege in the war of the Spanish Succession. In 1717 its fortifications were demolished. It has ample means of communication. The manufs., which are not of great [illegible] chiefly of cotton and

Bonnat, L (*b.* 1833), a I was born in Bayonne, and studied in Madrid and Paris. His reputation was first established by his 'St. Vincent de Paul taking the place of a Galley Slave' (1866), which was followed by other religious and realistic works, such as his celebrated 'Christ Crucified' (1874, Palais de Justice, Paris). Although he also painted several genre subjects, his fame rests chiefly on his portraits, marvellous works of [illegible] among the most [illegible] tor Hugo, Don [illegible] under whom [illegible] les Grévy. *See* Van Dyke's *Modern French Masters*, 1896.

Bonnefoy, or Bonfidius, Edmund (1536-74), a French jurist, born at Chabeuil, became professor of law at Geneva University, where De Thou was one of his pupils. His chief literary work was a treatise on Oriental jurisprudence. He was a friend of Cyjacius, another noted French jurist.

Bonner, Edmund (*c.* 1497–1569), Bishop of London, was of lowly birth, and was educated at Pembroke College, Oxford. He was patronised by Cardinal Wolsey, and on the latter's death was favoured by Henry VIII., who made him one of his chaplains, and sent him to Rome to press the claims of his divorce from Catharine. He was made Bishop of London in 1539. He was in favour of the principle of royal supremacy in Henry's reign, but refused to take the oath of supremacy under Edward VI., and was confined in the Marshalsea Prison from 1549 to 1553. He was restored to his see on the accession of Mary, and was conspicuous by his zeal in the persecution of Protestants during this reign. He refused again to take the oath of supremacy on the accession of Elizabeth, and was again sent into the Marshalsea Prison, where he died.

Bonnet (Lat. *bonetum*, stuff, thence cap made from stuff) was originally a soft cap or covering for the head. It was worn, and so called, in England until the latter years of the 17th century, and in Scotland till later. The genuine B. of the Scotch peasants was made of a thick woollen fabric, with no lining; it was of a round, flat shape, generally dark blue in colour, with a red tuft on the summit. It was extremely durable. The Glengarry B., which is still worn by Scotch soldiers, rises to a point in front, and has ribbons at the back. Stewarton and Kilmarnock, in Ayrshire, have been noted for the making of Scotch Bs. since very early times. The use of B. as applied to men's headgear has now fallen into desuetude, and the term is applied only to ladies' wear. A B. differs from a hat in fitting closely to the head, and often having no brim. It varies considerably, however, in both shape and decorations, according to the prevailing fashion. The Bs. of straw are mostly made in Tuscany, though Luton, in Bedfordshire, makes a large quantity. The most fashionable Bs. of the present day, like everything else in female wear, come from Paris. From the fact that small landed proprietors in Scotland continued to wear Bs. for some time after their use had been discontinued elsewhere, they were known as 'B. lairds. The B. of a ship's sail is an additional piece which is now laced on to the bottom of the sail, but was formerly at the top. The term is also used for various protective devices, and a slang name for a gambler's accomplice is a 'bonnet.'

Bonnet, Charles de (1720-93), a [illegible] philosopher. [illegible] on March 13. [illegible] ided for the law, but he was quickly drawn to the study of natural science. His observations and experiments on aphides or tree lice gained for him in 1740 the rank of corresponding member of the French Academy of Science, and three years later he became a fellow of the Royal Society. In 1745 appeared his first pub. work, which was called *Traité d'Insectologie*, and in 1751 his researches in botany and the results he

had obtained from his long work in this subject were pub. in *Recherches sur l'Usage des Feuilles dans les Plantes*. He next turned his attention to philosophy, his eyesight preventing him from still further continuing his natural science experiments, and in two essays, pub. respectively in 1754 and 1760, he asserted the prevalence of body over mind. His *Contemplation de la Nature* was pub. in the year 1764-65. His last work of importance was *Palingénésie Philosophique* (1769-70), in which he develops the idea he had already put forward that animal life is continued and perfected in a future state. He took little or no interest in politics, but spent the evening of his life in the quietude of his home near Geneva, where he died.

Bonnetable is the chief tn. of the canton of Sarthe, France, situated 14 m. from Mamers, on the Tripoulin. It has manufs. of boots and shoes, and tanning is carried on. Pop. 4500.

Bonnet piece was a gold coin of the time of James V. of Scotland. On it was a figure of the king, who was the first king of Scotland to have dates put on coins, wearing a bonnet on his head instead of a crown. This being the origin of the name of the coin.

Bonneval, the chief town of the canton of Eure-et-Loir, 9 m. from Chateaudun at the junction of the Loir and the Ozanne; pop. 4000.

Bonneval, Claude Alexandre, Comte de (1675-1747), a soldier of fortune of the 17th and 18th centuries. He was born in July, and at the age of thirteen joined the army. He served in sev. campaigns in Italy under such distinguished generals as Villeroi and Vendôme. Later, whilst serving in the Netherlands under Luxemburg, he was condemned to death by court-martial, and fled to Germany. Entering the Austrian service, he showed great courage, and distinguished himself by his conspicuous gallantry. With the Austrian army he fought against France, and also against Turkey. He was allowed, however, to return to France, but later rejoined the Austrian army. His ungovernable temper, however, led to a quarrel with Prince Eugene, his patron, and later to a quarrel with the governor of the Netherlands. He was again sentenced to death by court-martial, but the sentence was commuted, and he was exiled. He offered his services to the Turkish Sultan, by whom they were accepted, and he changed his faith, becoming a Moslem and taking the title of Ahmed Pasha. He helped to reorganise the Sultan's army, and was given the command of the artillery. He rendered great services to Turkey during the Russian and Persian wars, and was made governor of Chios. Later he fell under the suspicion of the Sultan, and was banished to the shores of the Black Sea, where he died.

Bonneville, Nicholas de (1760-1828), man of letters, was president of a dist. of Paris from the first days of the Revolution. With Fauchet he brought out the *Cercle Social*, the *Chronique du Jour*, etc. Under the Terror, 1793, he was imprisoned, and later, under Napoleon, he was persecuted. He was among the first Frenchmen to study Ger. literature. His *Nouveau Théâtre Allemand*, 1782-85, and *Histoire de l'Europe Moderne*, 1789-92, are still quite readable.

Bonneville Lake is an extinct lake of the U.S.A. which in a recent geological period extended over a quarter of the total area of the Great Basin, a vast region of inland drainage in the S.W., extending over Nevada, Utah, Oregon, and California. For further details, *see* GREAT BASIN.

Bonney, Thomas George (*b.* 1833), an Eng. geologist, born at Rugeley, and educated at Uppingham and St. John's College, Cambridge. He was twelfth wrangler in 1856, and was ordained in the following year. From 1856 to 1861 he was mathematical master at Westminster School, in 1868 he was made tutor and lecturer on geology of St. John's College, and in 1877 professor of geology at University College, London. He was president of the Geological Society, 1884-86; secretary of the British Association, 1881-85; and president of the Mineralogical Society and the Alpine Club. His works, which are numerous, include *The Alpine Regions*, 1868; *The Story of Our Planet*, 1893; *Volcanoes*, 1898, etc.

Bonny, a tn. in Southern Nigeria, West Africa. It is situated on a creek on the E. side of the river Bonny, near the mouth. It is swampy, and a most unhealthy tn. It has a large trade in palm oil. The river B. is one of the delta mouths of the Quorra. Its anchorage is good and safe.

Bonnycastle, John (1750-1821), a mathematician, was born probably in 1750 in Buckingham. He went to London, and later on kept a school at Hackney. He became private tutor to the sons of the Earl of Pomfret, and professor of mathematics at the Royal Military School at Woolwich. His works include: *The Scholar's First Guide to Arithmetic, Introduction to Algebra, Introduction to Mensuration and Practical Geometry*, etc.

Bonomi, Giuseppe (1739-1808), a British architect, born at Rome of It. parentage. He settled in England in 1767, was made an associate of the

Royal Academy, and in 1804 was created honorary architect to St. Peter's at Rome. He was largely responsible for the revival of the classical style of architecture in England. He was the architect of Langford Hall in Shropshire, and Dale Park in Sussex.

Bononcini, Giovanni Battista (c. 1672-1750), It. musical composer, born at Modena; lived at Rome, Berlin, and Vienna, and in London during 1720-31. Famous for his rivalry with Handel. His operas, which have considerable merit, include *Tullo Ostilio*, 1694; *Serse*, 1694; and *Il Trionfo di Camilla*, 1697. He is often confused with his brother, Marc Antonio Bononcini.

Bononia was in Roman times the name given to the cities now known as (1) Boulogne-sur-Mer, a port of France; and (2) Bologna in Italy.

Bonpland, Aimé Jacques Alexandre (1773-1858), a French traveller and botanist, was born at La Rochelle on Aug. 22. He studied medicine, and for some time served as an army surgeon. In 1799, together with Humboldt, he undertook a journey of exploration through Mexico, Colombia, [illegible] America. The [illegible] return to Europe he proceeded to explain in his *Plantes Equinoxiales*. He was given an official botanical post in Paris, but gave this up in 1816 in order to again journey to S. America, where he became for a short time professor of natural history. He resigned this post in order to explore Central America. He was arrested by Dr. Francia, dictator of Paraguay, and kept in prison for over nine years. Subsequently he lived at San Borja, in the prov. of Corrientes, and Santa Anna, where he died. His works may be mentioned *graphie des Mélastomées*, 1806; and *Description des Plantes rares de Navarre*, 1813.

Bonsignori, or Buonsignori, Francesco (*1455-1519*), an *Italian painter*, born at Verona. Comparatively little is known about his life. Many of his works remain at Mantua and Verona, and some are to be found in the principal European galleries. Vasari declares him to have been a pupil of Mantegna. His best known works are paintings of the Madonna with saints at Verona (Pinacotheca and St. Fermo), and portraits at Florence. *See* Vasari's *Lives of Italian Painters*, 1895.

Bonstetten, Albert von (c. 1441-1504), a Ger. monk and author, was a member of the Einsiedeln monastery of the Benedictine order, situated at Einsiedeln in Switzerland. He was chosen dean of the monastery in 1470, and spent his time in literary pursuits, writing many works connected with his monastery and its patron saint, Meinrad. His other works were numerous, and include: *Description of Switzerland*, 1836; *Banishment of Justice and other Virtues*, 1470; *History of the House of Austria*, 1491; and *Account of the Wars of Charles the Bold*, 1477.

Bonstetten, Charles Victor de (1745-1832), a Swiss writer and publicist. He was born at Bern, of Fr. descent, on Sept. 3. He was educated at first at home, but afterwards at Leyden, in France, and in England. On his father's death he entered political life, and became a district governor. But his ideas were too liberal, and after the taking of the Bastille he had to retire. In 1795 he again became a governor of the It.-speaking part of the republic, but again in 1798 had to retire because of his political ideas. He spent some of his time after this second retirement in Denmark, and finally settled down in Geneva in 1803, where he died. One of his greatest books was the study of the effect of climate upon different nationalities, *L'homme du Midi et l'homme du Nord*, 1824. Other works are *Recherches sur la Nature et les Lois de l'Imagination*, 1807; *Etudes de l'Homme*, 1821; *Pensées Diverses*, 1815.

Bonus is a word derived from the Lat. *bonus*, good, used in a jocular sense to denote benefits of various kinds. It is a sum paid to shareholders in a joint-stock company as an addition to the ordinary dividends. It is generally given out of accumulated profits, or the profit from some exceptional transaction, when it is not considered advisable to raise the [illegible] used by insur- amount added t of the policy by a distribution *pro rata* of the accumulated profits, or of the surplus. In a more general sense B. is used to mean any payment more than what is due.

Bonvalot, Pierre Gabriel, *b.* 1853 in Epagne (Aube), Fr. explorer. In 1882 he travelled in Central Asia, from 1885-7 in Persia and the Pamirs, and in 1889-90 in Siberia and Tonkin. Among the prin. books pub. by B. on his voyages are: *De Moscou en Bactriane*, 1884; *De Paris au Tonkin a travers le Tibet inconnu*, 1892.

Bonvin, François (1817-87), Fr. artist, born at Vaugirard. He taught himself painting, and although he took some of the Flemish masters as his models, his work is characterised by the portrayal of everyday life to a realistic degree, indicating a close study of the life of the people around

him. Indeed, most of his pictures have for their subjects incidents in the life of the working people with whom he had come in contact. Among his best known pictures are 'L'Ecole d'Orphelines;' 'La Charité,' 1852; 'La Basse Messe,' and 'La Cuisinière,' 1855.

Bony Fishes, technically known as Teleostei, constitute by far the largest and most important sub-class of fishes. They are to be found in fresh, salt, and marsh water, and their bodies vary in shape from the piscine and flat to the snake-like. The features which all forms bear in common are: a bony skeleton with vertebræ, a skin covered with soft light scales, an anus, optic nerves which cross without fusion, and the absence of a spiral valve in the intestine. They frequently possess an air-bladder, and the eggs usually develop into larvæ. The great authority on this subject, Dr. Günther, has divided the Teleostei into six groups: the *Acanthopterygii*, or spiny-rayed fishes, as the perch, mackerel, and blenny; the *Pharyngognathi*, like the above in some respects, but having only some of the rays of the fins spiny and the lower pharyngeal bones fused, as the wrass; the *Anacanthini*, with soft fin-rays, as the cod; the *Lophobranchii*, with tufted gills, as the pipe-fish and sea-horse; the *Physostomi*, with soft fin-rays, open duct to swim, and bladder, as the salmon, herring, and eel; the *Plectognathi*, with pectine gills bones of upper jaw movable, as the trunk-fish, globe-fish, and porcupine fish. *See* Dr. A. C. L. Günther's *Introduction to the Study of Fishes*, 1880; G. A. Boulenger's *Systematic Account of the Teleostei*, 1904.

Bonyhad is a Hungarian town, situated about 148 m. from Buda-Pesth, in the co. of Tolnu. It trades in corn, wine, and tobacco.

Bony Pike, Billfish or Garpike, is the name applied to the garoid fishes of the family Lepidosteidæ. They have elongated snouts, their bodies are covered with thick scales, and in habit they are predaceous. *Lepidosteus osseus* is a species commonly found in fresh waters of N. America.

Bonze (Japanese pronunciation of *fan sūng*, member of a monastery) is a member of a Buddhist monastery. The word is applied by Europeans to any priest in Japan and China.

Booby is a species of bird which is closely connected with the gannet, and receives its humiliating name from the ease with which it allows itself to be captured. With the gannet it forms the genus *Sula* of the family Steganopodidæ, but it differs from the gannet in breeding on trees and bushes, and in having no feathers on its throat and lower jaw. It is persecuted by the frigate or man-of-war bird, which belongs to a different genus of the same family, and is compelled to give up to it the fish which it has captured. The birds are cosmopolitan except on cold shores; *S. cyanops* comes from the S. Pacific, and *S. australis* the southern seas.

Booby Island is situated in Torres Strait. It is dangerous to navigation. Passing vessels frequently put off with supples of water and food for the island.

Book. The name given to a literary production, usually of one volume, but if of more forming a single work. The word has been variously derived, but the derivation which presents least difficulties is that from *boc* (A.-S. *beech*). Almost as far back as it is possible to trace any form of civilisation in the world, it is possible also to trace the existence of Bs. of some form or other. The early form of B. differed essentially from the printed and bound volume that we call a B. at the present time, but nevertheless the clay tablets, covered with cuneiform inscriptions, on which we find the decisions of the law courts of Babylonia, have a right with the printed matter of the present day to rank as Bs. More in the direct line of descent, however, are the papyrus rolls of early Egypt, covered with the hieroglyphics of the priestly Egyptians, and of enormous antiquity. The fashion thus set of recording events on papyrus was one which remained in existence for a long time indeed, and as late as the 13th century we find papyrus still being used as a medium for writing, although the earliest extant papyrus goes back to some 4000 years B.C. The Greeks gave to the papyrus which they used the name of βιβλος, and the plural of that word has given to us our modern word Bible. The supply of papyrus was at one time found to be gradually declining, and the prepared skin of sheep and goats was gradually brought into use as a substitute, proving so successful that it was only replaced later by the invention of paper, an invention which was introduced from the East, and to which the name of papyrus was transferred. The prepared skins perpetuated the name of the originator, the king of Pergamos, in the name of parchment. During the period of the predominance of papyrus the usual form of B. was the long roll wound round a stick, but with the commoner use of parchment the B. form as we know it at the present time began to be used. With the invention of printing the form of Bs. did not undergo any very great

change at the beginning. The type used was almost of a necessity similar to the caligraphy which had been in common use up to that time. The Bs. were first printed without title-pages, and the information concerning the printer and the place where the B. was printed was given at the end of the B. It was not until the beginning of the 16th century that Bs. began to be printed with a title-page, and the name and address of the printer, together with the date of printing. The Bs. produced in the early days of printing were very large, and owing to the method of binding very heavy as well. They did not immediately become cheap or common, but on the former point it is difficult to obtain definite information. During the 16th century the introduction of a smaller type, and the reduction in the size and weight of Bs., did much to popularise them and to make them cheaper, and many Bs. during this period were brought within the reach of ordinary people. The 17th century saw during its early days a falling off in the printing of Bs., which increased rather than lessened in price. Towards the end of the century, however, Bs. began to improve in printing, although they did not cheapen in price. The 18th century saw a great improvement in the printing and binding of Bs., and the prices of these Bs. again became reasonable. Bs. were often published by subscription, and then the price was high. Illustrations began to appear in them, and it is during this period that we get the beginning of the popularity of the novel, which was usually printed in several volumes. The price of Bs. during the greater part of the century was fairly uniform, and Bs. could be bought by all classes save the very poor, but towards the end of the century the prices again rose. The 19th century saw a vast improvement in every respect. Bs. were well bound, well printed, and in many cases well illustrated. The publishing of Bs. at popular prices began, although Bs. which were printed cheaply were as a general rule not printed, nor yet bound, well. The many inventions of the century, however, helped on the publication of Bs.—they were able to be obtained by every one; but the problem of the good B., well printed and well bound, at a really cheap price, was one of the problems which was solved during the early years of the twentieth century. Nowadays Bs. of all sorts and descriptions can be purchased by all sorts and conditions of men.

Bookbinding includes all those processes whereby the leaves of books are bound together in such a manner as to keep them in order and protect them from injury. It may be said to have begun when the method of making books from strips of parchment wound round rollers at each end, was superseded by the method of fastening leaves together at the back and placing the so formed book between covers for protective purposes. Before the days of printing, as early as the 6th century, the monks had carried the binding of manuscripts to a very high plane. They bound the manuscripts between boards, which were afterwards decorated with metal and jewels. This was known as the Byzantine style of binding. The majority of the books so bound were destroyed by people seeking for gems that were supposed to be hidden in their covers which were made of wood of great thickness. Then between the 10th and 14th centuries the monks of England, having copied and improved the designs of books brought from the East, became the foremost binders of Europe. The binding of books was now done by the aid of leather stretched over the boards and decorated with the impress of small stamps bearin
The introduct
gave a great
B., and as the number of books increased so the office of bookbinder became separated from that of printer. This, together with the introduction into Venice from the East of the use of gold leaf in the decoration of bindings, caused the end of the 15th and beginning of the 16th centuries to be one of the finest in the history of B. At this time morocco leather was first used, and with the aid of fine, delicate tools for impressing designs on covers, the result was the foundation of an exquisite art for the decoration of bindings. Venice was the seat of this rich ornamentation, and the distinct character of the designs originated there gives rise to the Venetian pattern of tool. Two of the most celebrated patrons of the art in Venice were Tommaso *Maioli* and Jean Grolier of Lyons, sometime treasurer to the duchy of Milan. When Grolier returned to France, he had his books bound under his own supervision in such a manner that they cannot be equalled even to-day in beauty of design or in excellency of workmanship. The French school of binders, led by Nicolas and Clovis Eve in the 16th century, Le Gascon and Du Seuil in the 17th, and Padeloup and Derôme in the 18th century, ably followed up the impulse given to the art in France by Grolier, and kept it unrivalled until the end of the 18th century. In Germany the books were usually bound in pigskin, vellum, or

calf; the latter being preferred for its softness and smooth surface and its great advantage
i.e. the impressic
the use of gold.
who stand out :
comparatively recent time. While we may mention Thomas Berthelet, binder to Henry VIII., and John Gibson in the reign of James I., yet chief notice must be paid to Samuel Mearne, binder to Charles II., who originated the Cottage style of ornamentation. In the 18th century Robert Harley, Earl of Oxford, had books bound in red morocco with centre panels surrounded by a broad tooled border, so founding the Harleian style. Other names to be noted are Baumgarten and Benedict, Kalthoeber (credited with the introduction of painted edges, though according to Zachnsdorf, he rediscovered the secret if it had been lost, for it had certainly been done in the 16th century), and Staggemeir. At the end of the 18th century Roger Payne used original artistic tools of his own design, always finishing his bindings in accordance with the character of the book. These were followed by Lewis, Mackenzie, Hayday, and Zachnsdorf, while to-day the art is again being revived, after a period of stagnation and imitation in the 19th century.

Modern divisions.—Large editions of books are now covered with cloth by machinery at a very quick rate. Since this process differs materially from that of leather binding, the ordinary cloth binding is described as casing, and the
for leather-cover
the boards are
before covering, whereas in casing the boards are covered and then glued to the book. Nearly all branches of B. to-day are performed by machinery. The work is divided into sections, forwarding and finishing. Forwarding includes the folding of the sheets, gathering, and collating them; sewing,
nming; gluing,
g; and making
is the process
of blocking or decorating the cover.

Folding.—Books are usually received from the printers in sheets which require folding. Each sheet is numbered with a signature. From the number of folds in a sheet a book is known as a folio, quarto, octavo, duodecimo, etc. Folio implies one fold down the centre, or two leaves to the sheet. Quarto refers to sheets folded again across, making four leaves to the sheet. Similarly, octavo means eight leaves to the sheet. When sheets are to be folded by hand, then the only instrument used is a folding stick, made of wood or bone, shaped like a paper knife. When folding, the greatest care is taken to keep the sheets in register, *i.e.* to see that the printed columns coincide, giving equal margins and horizontal printed lines. The most usual size for folding is the octavo, which gives sixteen pages in the section or signature. Folding can be done by machinery, of many different makes, but the principle in almost every case is the same. The machine is fed by a girl, who obtains correct register by means of *guides* or by *means of holes perforated* in the sheet in the process of printing, which have to be placed over pins on the feeding board. These machines can be obtained to give any number of folds required. An arm in the machine, with a thin blade, takes the sheet through a slot in the table, and it then passes between different sets of rollers at right angles to each other. The folded sheets are passed into a box at the side of the machine, at the rate of forty to forty-five a minute.

Gathering.—When the sheets have been folded into sections, then they have to be gathered into books. The usual way of gathering by hand is by laying piles of sheets on a long table, a section being taken from each pile in turn. A revolving table is sometimes used, but a machine has been patented which by means of moving fingers takes one section at a time from each gathering-box depositing them on a moving band. After gathering, the book must be collated, *i.e.* looked through to see that there are no sections misplaced or pages out of place.

Beating and rolling.—When the book has been gathered it is either beaten on a stone or iron slab with a stone or iron hammer, or it is passed between rollers regulated by a screw. In the case of beating it is protected with paper, and in rolling with tins. Either process is performed with only a few sections at a time, and the object is to make the book as solid as possible. Usually the book is pressed for a while after rolling to ensure solidity, and is sewn before it is pressed. This is now done in what is called a nipping machine.

Sewing and stitching.—After being pressed the books are then knocked to bring them square and are placed in the press again with the back projecting. The back is then marked with a pencil at a number of equal distances from the top in such a way that the space at the bottom is slightly larger than the others. Then at a little distance from the head and tail of the book a line is sawn in, so that what is termed the kettle-stitch shall not be divided during subsequent

cutting. Sometimes the markings are sawn in also, by hand with a tennon saw or with a machine-driven circular saw. Hand-sewing is done on a press which has a crossbar from which are suspended vertical *lay* cords. On these are fastened the cords which will bind the book together. These cords are then fastened to keys. Through small holes in the backs of the sections the needle is passed round these cords, so fastening the section to the cord. The sewing cord is continually joined up, so that it is a continuous cord through the whole book. When the back has been sawn in, then the sewing cord is merely passed up through the centre of the section and over the binding cord, and it is with this system that the hollow backs of most books are obtained. Of the many types of sewing machines, one takes the sections from a radial arm, where they have been placed by a sewer, punches holes in them, and sews them up at the rate of 20,000 sheets a day. The other type is a wire machine which turns wire into staples; forces them into the sections from the inside, and turns them down. It is fast, but will not supersede the old method for a while, be[illegible] of wire. already deals with would be called preparatory work in a large number of places, forwarding commencing with end-papering. At both front and back waste paper or end-paper is pasted on. Later the cover is fixed to the book by means of these. In end-papering many kinds of paper are employed, chief among which are Cobb, surface, fancy, bronze (German), coloured pastes, and marbled papers.

Trimming.—Most books are now bound with cut edges. In these cases, after sewing up, the book is placed either in a press and cut with a circular plough, or as is the case with large outputs, in a guillotine. A guillotine consists of a bed upon which the book is placed and adjusted by gauges, and securely held down by a press. A knife then descends which cuts the edge accurately at the places which have been marked with compasses. When the fore-edge has been cut, the bottom and the top may be treated in the same manner. With very fine work the cutting of the top and bottom is left until the book has been rounded and backed. Other forms of machines which have been devised are those which by means of a turn-table allow the three edges to be cut with only one setting of the book, and those which allow the bed to move upwards and downwards and the knife to remain stationary, thus admitting the tails of one pile of books and the fore-edges of another pile to be cut simultaneously.

Gluing up.—The books are now knocked up until they are square, and they are then placed between gluing boards, and a hot coating of glue, which is not too thick, spread over the back; the object of this is to aid in the holding of the sections together, and to make the back firmer to withstand the rounding and backing processes. Usually the back of the book is on a level with the edges of the gluing boards or press, but some binders leave a little of the back projecting, in order to allow the glue to work better between the sheets.

Rounding.—The trimmed books have now to be rounded. The purpose of this is to prevent the back sinking in. All books are not rounded, many books, *e.g.* Dent's Everyman series, having flat backs. When the book is to be rounded, it is either taken when the glue is not quite dry, or the glue is moistened slightly. It is then pulled into a round shape with the left hand and hammered with the right until it takes a rounded form. This is performed on both sides of the book and requires great care. Books are also rounded by machines of various types, all of which work upon the roller principle, the books being turned several times and placed against rollers with each turning.

Backing.—The book has now to be backed, or grooved, so that the boards may turn on them as on a hinge, and may fit closely against the sides. Therefore, according to the thickness of the covers, the groove must be made deep or small. The book is placed between two backing boards with the back slightly projecting, and the book adjusted until the rounding is even and the head and tail seen to be rectangular. The whole is now fixed in a press in such a way that the back will fall outwards, forming a sharp groove. It is then hammered into position. Backing is also performed by a machine which consists of a roller running over the clamped books. In some cases the rounding and backing is performed by the same machine. These operations of rounding and backing have the greatest importance to the finished book. ay result in or skewing, pearance of dents in the cover.

Decorating of edges.—Ordinary cloth-cased books have either plain trimmed edges or are deckle edged, *i.e.* rough and uncut. But as in the case of leather-bound books the edges may be decorated in a number of different ways, to prevent the soiling which must happen with white edges.

The edges may be sprinkled with spots of one or more colours. A simple sprinkling of one colour is obtained by letting drops of the paint fall from a brush rubbed on a fine sieve. When two or more colours are used then sand is spread over the edges to keep some portions protected from the colour. Again, edges may be coloured plainly, in which case the colour, mixed with paste and water, is spread over the edges with a sponge or brush. In order that the colour may be seen when the book is open, it is usual to draw the book back. Again, a paste edge is produced by laying on a very thick mixture of paste and colour, and working designs with a cork or the finger tip. One of the finest methods of decorating edges is that known as marbling. This is a special branch of the trade which requires experts, and is made a specialty of. It depends upon the fact that colours mixed with oxgall will float upon a sized surface, and a colour containing more gall will force the first off. Again, they can be drawn about with a stick and still will not mix. The smooth edge of a book will take these colours up, so the marbling is prepared in a trough and the edge of the book dipped in it diagonally from corner to corner. This must be done before the book is rounded, or if after, then the book must be knocked back for the process. There are many recognised varieties of design in marbling, the commonest of which is comb or feather marbling. The most elaborate system of decoration is gilding. This is performed by placing the book in a press and scraping the edges smooth with a steel scraper. A mixture of black-lead and glair — white of egg beaten to a froth in water—is then rubbed over the edges, and when this is dry the gold leaf is laid on the edge from the gold cushion to which it has been transferred from the gold-leaf book with a gold knife. The book is now gently turned to allow the glair to drip off, and at the right moment, the burnisher polishes this with a highly polished agate or bloodstone. To produce a dull gilt the burnisher is rubbed over tracing paper waxed on the side adjacent to it and with the other side resting on the edge. If a high polish is required the edge is afterwards rubbed with a linen rag and a little beeswax, and again burnished. As with marbling, the fore-edge has to be made flat, which necessitates it being tied back if it has been rounded first. Among the different types of gilding may be mentioned plain gilt, gilt on red, as in bibles; tooled with a design, or painted with a landscape only seen when the book is open.

Casing.—After a lining of mull or paper has been laid on the back of the book to strengthen it and to cause a hollow back, the difference between cloth casing and B. is apparent. For in casing the covers are now prepared from strawboards, coloured cloth, and stiff paper for the back. After being cut to the size required, the cloth is glued carefully and the backing paper and boards laid on: the edges of the cloth being cut at the corners, to prevent thick folds when it is turned over the boards. In this, again, machines have largely taken the place of handwork. After these covers have been finished, as will be explained later, they are pasted to the books and pressed, after which the cloth-cased book is ready for use. This, too, is now done by machinery.

Binding.—With leather binding the process is different in most cases. Although sometimes the leather covers are made separately and placed on the book complete, yet the proper method of binding is that by which the covers are built up around the book. To the book in the state already described under the decoration of edges, head bands are added of vellum or catgut covered with silk or cotton, or of calico over cord. The purpose of these is to prevent too great a strain coming on the book when it is being taken from a shelf. Bands—five as a rule — of leather are now pasted or glued on the backs of the books, and to these the mill or straw boards may be fastened, either in the ordinary way, by gluing to the inside, or by gluing the band to the outside of the cover, when there is a deep groove, or the bands may be drawn or laced through the covers. In the case of books which have a flexible back, the leather is fastened directly on to the book, and it consequently adheres to the back of the book, although it is flexible enough to allow of the book opening.

Coverings. — Bound books are covered with either split sheepskins, sheepskins, morocco, or any other leather, parchment, vellum, cloth, velvet, and imitation leather. Special processes are required for each of these. Those bound in leather may be either bound in whole leather, or half bound, having the corners and back made of leather and the sides of cloth or paper. The third type is the limp type, which has the cover flexible and pasted directly to the back of the book. After the covering has been put over the boards the end-papers are pasted down to the boards and the inside covered with paper.

Finishing.—With bound books now (and with cased books before the cover is added to the book) the

cover has to be embellished. When small ornaments are used and made up into a design, it is known as hand-finishing, and when a large design is used then the process is known as blocking. In either case the tooling may be blind or gold. Gold tooling is performed by pressing gold leaf on to a specially prepared surface, and brushing off the gold leaf not stamped on. Blind-tooling is of course merely an impression on the leather or other cover, without any colour whatsoever. Blind-tooling is sometimes termed antique or monastic tooling. Blocking is now done by machines in several colours at once, at the rate of 700 to 800 copies per hour.

Bible bindings are usually in leather, and offer facilities for a display of taste on the part of binders, owing to the custom of having rounded corners, limp, soft corners without flaps, or yapp — soft with flap — covers, specially gilded edges, and tasteful linings for the covers.

Account-book binding needs special care, and is usually performed in the right manner by building the covers up on the book. The head bands, boards, and end-papers are much stronger than in any ordinary classes of binding. See Cockerell, *Bookbinding;* Roger, *Art of Bookbinding;* Zaehnsdorf, *Bookbinding;* Stephens, *Commercial Bookbinding.*

Book-clubs. There are two kinds of B., the first for the purchase and reading new books, the second for the printing of books in connection with a certain subject or study. Formerly many clubs used to be formed for the purchase of the best works of the day as they issued from the press, and for the distribution of them in turn among the members. The books thus bought were sold annually, and the proceeds carried forward. Such clubs are now practically extinct owing to the growth of cheap literature and circulating libraries. The other kind of B., for the printing of books, still exists, both in this country and the U.S.A. As first founded, they were largely convivial clubs, holding dinners at intervals. Each member was bound to defray the cost of reprinting as many copies of some scarce work as there were members in the club; the chairman's copy was generally printed on vellum. This practice is now superseded, each member of a B. paying an annual subscription. The oldest B. is the Dilettante Society, which dates from 1734; another very anct. club is the Cymmodrovion, or the Metropolitan Cambrian Institute. The first B. which was carried on after modern methods was the Roxburghe Institute, which was instituted in 1813. Otherfamous B. are the Bannatyne Club, founded by Scott in 1823; the Maitland Club; the Abbotsford Club; and the Camden Society.

Book-collecting. It is axiomatic among book-collectors that the value of a library must depend almost entirely upon the skill of the particular collector. B. may assume many forms, but there ought to be some central idea dominating the bringing together of a mass of books, coupled with the adoption of some method of classification. Some collectors are attracted almost solely by the rarity of a book, others by the age: yet others by the lure of a first or early edition, by the splendour or tastefulness of the binding, while some desire to get together as many books as possible on certain specific subjects either for their own edification or with a view to ultimate transference to the public. The ideals of book-collectors change with the times, and it serves no purpose arbitrarily to give precedence to any particular one. Hardly more can be said than that the dominant idea should result in the collection of books which both contain an element of enduring interest and are characterised by rarity or other extrinsic qualities which ensure a high market value. B. in the true sense must be distinguished from the formation of a public or working library. Again if it is desired merely to procure as large a number of different books as possible, the British Museum collection, which numbers over one-third of the books extant, would be the ideal collection. Finally, a book-collector should not be a 'bibliomaniac,' or person who, regardless of its points, collects, yet never reads, any book that happens to strike his fancy. An excellent list of rare, curious, and valuable books, compiled by a bookseller who was evidently anything but a bibliomaniac is to be found in *A Journey Round the Library of a Bibliomaniac*, by Wm. Davis, 1821. It is often said that the element of rarity is over-estimated by book-collectors. In this connection it is not far from the truth to assert that rarity does not depend on the number of copies originally printed, but rather on the existence or otherwise of the belief that any particular book will always be easily procurable. An illustration of this, given in Slater's *Library Manual*, is furnished by the celebrated 'Elzevirs,' or books bound by Louis Elzevir of Leyden, who flourished in the 16th century. Although the market was for that period flooded with 'Elzevirs' they never became common, and are almost as diligently sought after as ever. B. in the modern sense is generally said to have originated in the

public-spirited action during the Tudor period, after the dissolution of the monasteries and the plundering of the monastic libraries, of Archbishop Parker and Sir Robert Cotton, who made it their business to rescue as many of the books as possible. A number of modern collectors owe their treasures to the purchase of old libraries belonging to private owners. But a certain eclecticism has to be exercised, for not all the old private libraries constituted collections in the appropriate sense, many of them being overwhelmed with theological works, and many others being accumulations of books purely for the purpose of study. The tasteful bindings of Grolier (*see also* BOOKBINDING) and other French and also Italian bookbinders which appeared after the Renaissance, probably added a stimulus to a form of B. Undoubtedly an immense impetus was given to B. by the introduction from Holland towards the end of the 17th century of the custom of selling old books by auction, and the hobby of B. quickly became fashionable. Prices have fluctuated from time to time. Greek and Latin classics, even those of the 'Elzevir' and 'Aldine' Presses fell in value in the course of the 19th century. The close of that century, however, saw a rapid increase in the prices of specimens of early printing, illuminated manuscripts, first editions of English classics, and the earlier French and Italian prints. Caxton's, however, have more than held their own. Slater in his *Manual* of 1884 prices copies at from £100 to £500. In the *Book Prices Current* for 1912 the *Canterbury Tales*, printed by Caxton about 1478, is priced at £905. Some of the most celebrated sales held in this country include those of the libraries of the Duke of Roxburghe in 1812 for £23,400; Wm. Beckford (author of *Vathek*) in 1823 for the record price of £89,200; Richard Heber in 1834-7 for £57,500; the Earl of Sunderland in 1881 for £56,580; the Earl of Ashburnham in 1897-98 for £62,700; and Lord Amherst of Hackney in 1908-11 for £34,878. Volumes A to D of the Huth Library have up to Sept. 1912 produced £80,990, so that this sale when completed will easily produce the highest sum ever reached in this country. For full information as to prices, *see* the annual volumes of Slater's *Book Prices Current*. As to technical appellations and marks by which the genuineness of old books may be tested, *see* Slater's *Library Manual*. For other information, *see* Elton's *Great Book Collectors*, Fletcher's *English Book Collectors*, and Guild's *The Librarians' Manual*.

Book Illustrations, *see* ILLUSTRATIONS.

Book-keeping is the science of recording commercial and pecuniary transactions in a systematic and accurate manner, that will preserve a distinct record and thus enable one at any subsequent date to understand their nature and effect with clearness and expedition, and also enable one to ascertain the exact state of the financial position of a business. It is of the utmost importance that all transactions should be correctly entered, as the stability of a business depends on the accuracy of its books, for these may be regarded as a mercantile chart, by a reference to which a merchant should be able to obtain information as to his trading: whether a certain dept. is paying or worked at a loss, and whether his business is improving or likely to lead him to the bankruptcy court. That bankruptcy is often caused through inefficient B., or keeping no books, is very evident, for hundreds pass yearly through the bankruptcy court whose books are hardly intelligible. The satisfaction arising from ready reference to one's commercial transactions should induce him to understand the practice of systematic B. Bankrupts can be punished for keeping unsatisfactory books (the Bankruptcy Acts, 1883 and 1890). Companies registered under the Companies (Consolidation) Act, 1908, are compelled to keep at least five statutory books, and have their books audited annually by a 'public accountant.' Under Section 26 of the Companies (Consolidation) Act, 1908, it is obligatory for a public joint-stock company to submit an annual statement in the form of a balance-sheet, audited by the company's auditors, to the Registrar of Joint-Stock Companies. The earliest known treatise on B. was by Lucas de Burgo, 1494, but the subject can be traced to the introduction of barter, and whenever the transactions involved credit, the then traders had recourse to the elementary form of the notched stick, or chalk marks on a handy rock. In the 15th century the great mercantile cities of Northern Italy, at that time the chief commercial centres of Europe, adopted the principles of double entry (*doppia scrittura*), and this system, under the name of the 'It. method,' gradually made its way over Europe, many of the original names still being used in the practise of the science. The double entry system first appeared in England about the beginning of the 17th century, and sev. books were produced on the subject, but only contained a modified version of the 'It. method.'

There are one or two different systems of B., and the so-called single entry is but an unsystematic, unreliable, and often misleading method the very reverse to a system. It merely consists of personal accounts, which only enables a trader to ascertain with whom he trades, and a mass of incomplete memoranda from which it is almost impossible to discover whether a profit has been made or not. The double entry principle is the only system of any use; it is mathematically correct in its results, and gives a complete statement of all business dealings. The books kept by a merchant vary according to his business, and on taking up the study of B. one is not taught how to keep the books of a particular trade such as those of a cloth merchant, wine merchant, or a publisher: but the principles that will admit of general application to modern business, and this knowledge an intelligent person will have no difficulty in applying to any specific business, the difference being, as one can see, only a matter of detail. The chief books used in a firm keeping their transactions and accounts in the modern method are:

Private ledger.—This contains the records of the capital and 'drawing,' and the profit and loss accounts; thus if there were two partners in a firm, each contributing as capital £5000, the respective amounts would be credited to separate 'capital accounts.' The heading would be *Merchants' Capital Account*, and the amount of cash paid in by one partner would be entered on
first the ye
£5000,' th
employed
Drawing account: In this would be entered on the left hand (debit) side the sums drawn out by the partners, and on the credit side the interest allowed on the capital of each partner, and also the share of the profit realised or loss sustained; when the drawing account is balanced the difference should be transferred to the respective capital accounts of the partners. *Profit and loss account:* To this would be debited all the trade expenses, and on
have the gro
of course, as
transferred to the drawing account.

The cash book is practically a part of the ledger, which is separated for purposes of convenience. In modern B. it is always taken for granted that the cash book is separate from the ledger, and is used alone for entering cash receipts and payments; as this is an integral part of the ledger, all items in it are separate halves of two-fold entries; thus cash coming in from John Jones, £6, would be entered in the cash book on the debit side, and posted (the act of separately transferring the entry to the account which such an entry affects in the ledger). This would make the double entry. Thus we see that every entry that is debited in the cash book is credited to a corresponding account in the appropriate ledger, and *vice versâ*. It is the practice of a cashier to enter cash receipts from the accompanying statements or cheques, and the payments from the memoranda or counterfoils in the trader's possession; then the corresponding entries (debit or credit) are made as soon after this as possible. The cash book should be balanced monthly, checked by the balance in hand, at bank, and

Cash receipts, as per cash book						£2000	17	6
Cash payments, as per cash book						1560	4	6
Balance						£440	13	0
In hand—								
Gold	£10	0	0					
Silver	5	10	6					
Copper	0	0	6					
						£ 15	11	0
At bank						125	2	0
						£140	13	0

The sales or day book is used daily to record particulars of goods sold on credit, and is usually in an analysed form, to facilitate the dissecting and summarisation of a variety of goods; thus, by employing a system of grouping the different sales, the merchant can tell at a glance what particular dept. or class of goods is selling the most. A simple form of analysed sales book would be required by a trader dealing in corn, flour, and maize, it would be constructed thus:

SALES BOOK (ANALYSED FORM)

Date	Sold to	Particulars	Fol.	Corn	Flour	Maize	Total
				£ s. d.	£ s. d.	£ s. d.	£ s. d.
1912 Oct.	J. Jones	1 Sack Flour	66	—	6 0 0	—	—
		1 " Corn		10 0 0	—	—	—
		1 " Maize		—	—	10 0 0	26 0 0
				10 0 0	6 0 0	10 0 0	26 0 0

When the particulars of an order have been entered in the sales book, the invoice should be made out therefrom and dispatched to the customer, then the entry should be posted to the debit side of the customer's account in the ledger: this makes the double entry. The sales book should be carefully added up, the totals carried forward, and at the end of a given period, usually monthly, the final totals are posted to the credit of the sales account, thus showing at a glance the correct sales of each particular line.

The purchase or bought day book.—In many business houses, purchases form a considerable part of the transactions, and various methods are employed to record them as concisely as possible. If the trader employs a good system, the labour involved recording them is considerably lessened. It will be found that the purchases 'on credit' are very numerous and invoices will be received of all shapes and sizes, and in order to avoid considerable postings to the 'purchases account,' and the 'bought day book,' or as it is usually called, the 'purchases journal,' is employed; this is on the same principle as the 'sales day book,' and in this all credit purchases are entered, the various purchases extended to their respective columns, and as the persons named in the 'purchases journal' are creditors they will therefore be posted to the credit side of their personal accounts, as with the sales book. The 'purchases journal' would be added up at the end of a period and the totals posted to the debit of the purchases account, thus saving a multitude of entries in this account.

Journal.—In modern commercial practice the journal proper has almost been done away with, in fact some important business houses employ no journal proper at all. On the Continent, however, the journal is still extensively used, being ruled to contain the whole of a trader's transactions. In France, under the Code of Napoleon, its use was made compulsory. It is now used for recording such transactions as opening and closing entries, especially for those that do not come within the scope of other books, such as adjustments, bad debts, interest, etc. The common form of journal is simple: it consists of columns for the date of the entry, particulars, folio, and two cash columns for debit and credit; a usual entry would be thus:

JOURNAL

			Dr.	Cr.
1912		Folio	£ s. d.	£ s. d.
Oct. 1	Bad Debts Account . . .	66	6 0 0	—
	To H. Cooper . . .		—	6 0 0
	Being amount written off. Debtor having absconded.			

Bill Book.—It is the custom of many trading concerns to make and receive payments by methods differing from coins, bank-notes, or cheque. 'Bills of exchange,' or 'drafts,' are stamped promises to pay, and according to the Bills of Exchange Act, 1882 (15 and 46 Vict. chap. 61), may be defined as an unconditional order in writing addressed by one person to another, signed by the person giving it, requiring the person to whom it is addressed to pay on demand, or at a fixed or determined future time a certain sum in money to, or to the order of, a specified person, or to bearer. A bill of exchange has many advantages, although some business houses do not adopt bills of exchange, considering them as significant of a state of weak finance. Some of the chief advantages of a bill of exchange are: it is a negotiable instrument, a convenient method for the transfer of debts, and there is prompt legal recovery in the case of non-payment. A firm may be financially embarrassed but have a considerable amount owing in book debts, so they arrange for some of their debtors to accept a bill drawn upon them: they can then obtain financial relief in a number of ways: discount the bill with a banker or bill broker, who will advance the money on it, subject to the deduction of a small discount, or they may transfer it by endorsement to a creditor. As it would be inconvenient to post a bill of exchange direct to the ledger on account of the numerous features of it, *e.g.* the dates of acceptance and maturity, the names of the acceptor, the bank payable, etc., it is usual to keep a separate record called a bill book, which sets forth in analysed form the date drawn, the drawer, bank payable at, tenor of bill, and due dates, these particulars being required for the due recording of a bill. When a bill has been accepted

and received by the 'drawer' it is entered in the bill book, and the 'acceptor' immediately credited, and at the end of a given period the bill book is added up and the total transferred to the debit of the 'bills receivable account,' thus we have the double entry. The entries necessary for a bill payable would be *vice versâ*.

Returns book.—In many cases a trader returns goods for various reasons; some may have been damaged in transit, portions may be unsatisfactory and not up to sample, the wrong goods may have been sent. In the case of 'returns inward' a credit note should be at once made out, stating particulars of the returns and allowance, and should be entered at the same time in the returns book, which follows on lines similar to the 'sales day book,' the item should be posted from there into the customer's account in the ledger; the returns book should be added up at the end of the period, and the totals transferred to the debit of the 'sales account.' *Returns outward:* In the majority of cases are entered at the back of the 'purchases journal,' posted from there to the creditor's account, and the total of the 'returns outward' posted to the credit of the purchases account.

Ledgers.—An impersonal ledger would contain particulars of all property and nominal accounts. Property or real accounts would consist of buildings, plant, and machinery, stock, goodwill, copyright, patents, etc., and in the case of these accounts all property acquired is posted on the debit side of the account, and is always regarded in business as a debtor to the trade for the amount paid in that direction. Sometimes property is parted with; when this is so, the respective property account should be credited. *Nominal accounts* are the subdivisions of the profit and loss accounts, and would be divided under the heading of wages, discount, trade expenses, interest, rent, rates, and taxes, bad debts, depreciation, repairs, etc. When these represent losses they should be debited to their respective accounts, when a gain, such as interest, discount, or rents received, then they should be credited. *The sales ledger* contains the record of all the sales to customers. In very large establishments having an extensive turnover it is necessary to have the sales ledger divided into parts or sections, such as town, country, and foreign, and in some cases these are subdivided, so that one ledger may be in four, then each ledger will contain so many letters of the alphabet, the first ledger having the letters A to G, and the others running consecutively. In the case of a large business it is very desirable that the ledgers should be divided, as this facilitates the discovery of errors, each book being balanced separately, and it also does away with the inconvenience of a cumbrous book. *Bought ledger* is the facsimile of the sales ledger, but the entries are reversed; all items being posted from the purchases journal and placed on the credit side of the bought ledger. This and the debtors ledger especially should be posted daily.

Trial balance.—This may consist of the total postings to the ledger, or the balances appearing at a certain date before the closing entries have been made. The correct method to use when preparing a trial balance is to extract the debit and credit balances and not the total postings, and is generally adopted in business. It exhibits in a concise form the information from which, after the necessary adjustments have been made, a profit and loss account and balance sheet can be constructed. The total of the debit balances should agree with the total of the credit balances, and if they should not do so it shows at once that an error has occurred either in postings or in the compilation of the trial balance. Even if both sides agree there is still the possibility of compensating errors, *e.g.* an item of trade expense, which should have been treated as a loss, may have been entered as an asset. A trial balance, therefore, only proves that there is a credit for every debit, but in practice, if the trial balance agrees, it is generally taken that the postings have been correct, and that the accuracy of the books has been proved.

Balance sheet is a summary in a classified form of the balances remaining in a set of books, kept by double entry, extracted after all the nominal accounts have been closed and all adjusting entries made. It shows the position of a business in relation to its proprietor and other parties, and it is prepared with a view of ascertaining the correct financial status of a trading concern, whether solvent or insolvent. Liabilities are shown on the left-hand side and the assets on the right. As a balance sheet is not an account, but a transcript of ledger balances at a given date, it should never be headed with 'Dr.' or 'Cr.'; some accountants, however, still occasionally prefix 'To' and 'By,' which is incorrect. A simple form of a balance sheet is:—

BALANCE SHEET OF WILLIAMS & McDONALD ON 31st DEC. 1911

Liabilities			*Assets*	
Capital Accounts—			Freehold Premises . .	£10,000
R. H. Williams	£10,000		Plant and Machinery .	5,000
P. McDonald .	10,000		Stock on hand . .	4,000
		£20,000	Sundry Debtors . .	8,000
Sundry Creditors—			Cash at Bank . . .	1,000
On open accounts . .	£4.000			
On Loan . .	2,000			
		6,000		
Balance, Profit .		2,000		
		£28,000		£28,000

B. is one of the subjects taught in the majority of the education institutions in London and the provs. It is possible to obtain free tuition at any of the evening class centres held by the London County Council during the winter session. The pupils are entered for the examinations held by the public examination bodies, at whose examinations any one may sit on payment of a small fee. The prin. London bodies are: the London Chamber of Commerce, the Society of Arts, the National Union of Teachers; the Association of Book-keeping Teachers, etc. In addition to the above are the special professional societies for whose examinations only those who are specially qualified or articled are permitted to sit. Text-books recommended for use: *Book-keeping and Accounts*, by L. C. Cropper; *Students' Book-keeping* (Fieldhouse).

Book-land, *see* BOCLAND.

Book-lice are insects of the family Psocidæ and order Psocoptera, which destroy the bindings of books; the peculiar tapping noise they make has earned for them the title of *death-watches*. *Atropos* and *Clothilla* are genera which include mischievous B.

Book-making, *see* BETTING.

Bookplates. In its technical sense the word bookplate is synonymous with the term *ex libris*. *Ex libris* means literally 'out of the books' owned by any particular person. It denotes a label, impression, or inscription, showing the name or monogram of the owner of the particular book, and is frequently adorned with artistic embellishments, besides showing the owner's arms or heraldic device. B. are generally to be seen pasted just inside the front board or cover of the book. Expensive B. should never be gathered and sewn directly with the folded sections (*see* BOOKBINDING) at all, but only stitched or pasted on to guards of strong paper or linen, as used in atlases, or sometimes in collections of engravings. They can then be afterwards sewn in with their corresponding sections by the guards. In England there is no probability of any discovery of B. before the reign of Elizabeth. Movable B. in hand-painted woodcuts, displaying the particular heraldic escutcheon supported by some allegorical figure, are recorded by Warnecke as having adorned the books given in the 15th century to a German branch of the Carthusian monks. The B. of Sir Nicholas Bacon, now to be seen in the university of Cambridge, seem to be the earliest extant English B. It contains a somewhat flamboyant device of a shield, with two stars at the top left hand corner and again towards the bottom right, with bars across the remaining corners, the whole surmounted by a representation of the head and neck of a knight in armour and a wild boar. At the bottom is the motto *Mediocria firma* (things which are moderate are sure), and also in Latin words indicating that he presents the book to the library of Cambridge University. There are two ways of regarding B. as judged by the light of their later history. They may be looked upon merely as adjuncts to the binding of a book, fulfilling the purely utilitarian function of denoting the owner, or on the other hand, as works of art, reflecting the current taste in decorative symbols. In this latter and more elaborate class of cases even great names have figured in the past as designers, *e.g.* the B. of Spengler was engraved by Albrecht Dürer. Many B., too, are known to have been designed by Holbein and other German masters of painting. English B. underwent many changes in style. The earliest were plain devices in no way reminiscent of the ornate B. devised in Germany. They retained throughout the period between Elizabeth's reign and the end of the 17th century a purely armorial character. It was only after the accession of Charles II. that English B. began to reveal a higher degree of distinctiveness with a far greater pro-

fusion of the ornamental accessories of drapery and scroll-work, but with a corresponding plainness in the heraldry itself. Later the elaboration of the drapery and scrollwork surrounding the shield becomes very considerably modified, and a still greater simplicity reveals itself in the armorial element. Representations of oaken frames fancifully designed, and the conventional shell, and scroll-work in imitation of the rococo decoratic manship become ence bet is that in the later all semblance of flatness or mere outline in design disappears in favour of the pictorial representation in light and shade of all manner of objects, *e.g.* there is one composed entirely of books arranged in the form of a frame with a scroll in the centre, bearing on its face the initials of the owner. The introduction of so many different objects bearing no sort of relation to the armorial bearings of the owner naturally produced a general appearance of incongruity, and led to a reaction in favour of greater consistency and simplicity of style. The shield once more comes to the front as the really prominent object, but its shape, instead of varying with the owner's taste, becomes almost always assimilated to that of an urn. The accessorial ornamentation consists in general of sprays and wreaths, but occasionally of something far more elaborate, *e.g.* a B. designed by Bewick shows an urn-shaped shield with the head of some mythical heraldic animal upon it, resting on a bluff of ground surmounted by foliage with water, boats, and a church in the . There is a consider and varic been established. Book are of quite recent origin, a fact which has led to the conclusion that the systematic study of B. is a modern event. At the present day B. are as popular as ever, and many modern English artists of great repute have made a special feature of designing them, the B. for the most part being reproduced by some form of process work. In style they are as highly artistic as ever, but there is once more observable a reversion to the elimination of heraldic in favour of symbolic devices.

Book-scorpion, or *Chelifer cancroides*, is an arachnid of the order Pseudoscorpionida and family Cheliferidæ. They are brownish in colour, have two eyes, and probably live on book-lice (*q.v.*).

Book Trade, *see* PUBLISHER.

Book-worm is the name given to any larvæ which feed on the paper, binding, and paste of books which are not often used, or are stored in museums. They may merely attack the binding, or may bore tunnels through the pages. Sev. species of *Anobium*, *Anthrenus*, *Ptinus*, and *Dermestes* are coleopterous insects of destructive nature which damage books. In America the *Phyllodromia* (or *Blatta*) *Germanica*, a cockroach known as the Croton bug, performs the function of a B., though it is naturally not considered as one. Frequent overhauling of books is the best preventive of such pests. *See* W. Blades' *Enemies of Books*, 1896; J. F. X. O'Conor's *Facts about Book-worms*, 1898.

Boole, George (1815-64), an English mathematician and logician, was born at Lincoln. He became an assistant master in a Doncaster private school at the early age of sixteen, and later established a school of his own at Lincoln. In 1849 he was made professor of mathematics at Queen's College, Cork. His first important publication is the *Mathematical Analysis of Logic*, 1847, followed in 1854 by *An Investigation of the Laws of Thought, etc.*, the work on which his fame chiefly rests. He also published a *Treatise on Differential Equations*, 1859, and a *Treatise on the Calculus of Finite Differences*, 1860, and contributed many valuable articles to mathematical journals.

Boom, a Belgian tn., in the prov. of, and 12 m. from the city of Antwerp. There are brick and tile works, breweries, salt and starch manufs. Pop. 15,925.

Boom is, *in a ship*, the name of the spars which are attached to the mast at one end, and controlled by the sheet at the other end, extending along the foot of the sails. According to which sail it is connected with, it is termed the jib-boom, the main-boom, *etc.* In modern ironclads Bs. are fitted along the sides, and form the supports for the torpedo nets. A B. is also used for the barrier of timber, etc., which is fastened along the mouth of a harbour in war to prevent the entrance of the enemy's vessels, as the famous B. in the siege of Londonderry in 1689.

Boom, a word used with regard to commerce. In this sense its origin is American, having come into use during the latter half of the 19th century. B. (M.E. *bummen*) means 'to make a deep continued sound,' and as a sudden movement often produces an increasing sound, B. has come to mean a sudden spurt of activity in the business world.

Boomerang, a missile made of wood used by the aborigines of Australia

and of some other places. There are two kinds of B., which must be carefully distinguished, the return B. and the non-return B. The latter is used by the natives for the purposes of war. The origin of the term is not definitely known, but it seems to have been the word used by the aborigines of New South Wales for the weapon which they themselves used. It does not boom when travelling through the air, but rather makes a whistling noise, and for that reason may be regarded as not being onomatopœic. The return B. is made of hard wood, and in Australia is always curved at an angle of between 90° and 120°. It is between two and three ft. long, and weighs roughly half-a-pound. One side of it is flat, the other convex, and along the convex side runs a sharp edge. The arms have a skew, and upon the skew depends the return or non-return of the B. The B., when about to be thrown, is held vertically, and when thrown as much rotation as possible should be imparted to it. After describing a circle of considerable diameter, it returns to the thrower. It has been known to return to the thrower even after striking the ground. No record of B. throws has been kept, but a skilful thrower can make the weapon travel over 200 yds. The war B. is of the non-return type, and is a weapon of considerable effect in the hands of a skilful aborigine.

Boomplaats, a tn. of S. Africa in the Orange Free State. It is the site of a battle fought in 1848, when the British under Sir Harry Smith defeated the Boers under A.W. Pretorius.

Boondee, *see* BUNDI.

Boone, a city of B. co., Iowa, U.S.A. It has machine, gloves, tobacco, harness, tile manufs., besides a pork-packing factory. Pop. 6520.

Boone, Daniel (1734-1820), American backwoodsman and pioneer, of Eng. descent. He was born in Pennsylvania. His early life was spent on his father's farm, but a fair amount of his time was given to hunting. In 1767 he visited the dist. of Kentucky, which, however, he was not the first to discover. Later in sev. campaigns he explored more thoroughly the ter. of Kentucky, meeting with many adventures. In 1775 he led the party of settlers who founded the tn. of Boonesborough in Kentucky. Later, during one of his expeditions, he was captured by Shawnee Indians, adopted into the tribe, and only managed to escape with considerable difficulty. For a short time he sat in the Virginia legislature as the representative of Kentucky. He lost all his land in Kentucky owing to his want of formal titles, and retired later to Missouri, where in 1803, when this ter. came into the possession of the U.S.A., he again lost his land for the same reason. In 1812 he was granted some land as a recognition of his services. Many biographies of him have been written, one of the best being that by Reuben G. Thwaites, *Daniel Boone*, 1902.

Booneville: A town of Oneida co., New York, United States of America, 58 m. E. of Oswego. Manufactures gloves, leather, churns, etc. Pop. 4118.

Boonton, a city in Morris co., New Jersey, United States, situated 25 m. N.W. of New York. The prin. occupation of its inhab. is smelting the magnetic iron of the neighbouring Kittalinny Mts., and there are large iron-works and blast furnaces for this purpose. Pop. 4000.

Boonville, an important banking city in Cooper co., Missouri, U.S.A. on the r. b. of the Missouri, about 40 m. N.W. from Jefferson city. Coal, iron, and lead are found in the neighbourhood. Its manufs. are bricks, earthenware, marble monuments, carriages, flour, and tobacco. It is served by the Missouri Pacific, and the Kansas and Texas railways. Pop. 4377.

Boops, a genus of acanthopterygii and family Sparidæ (sea-breams), is characterised by the species possessing trenchant teeth. They are carnivorous, often brightly-coloured fishes, inhabiting tropical and temperate seas, and are usually edible. *B. salpa*, or *Sparus salpa*, has a bluish body with yellow stripes.

Boorde, or Borde, Andrew (1490-1549), an Eng. physician and author, was educated at Oxford. He joined the Carthusians while still a minor, and was made suffragan bishop of Chichester in 1521. He was freed from his monastic vows in 1529, and then studied medicine, afterwards travelling on the Continent. He was, after he had returned to London in 1534, sent on a mission by Cromwell to discover the state of feeling which prevailed abroad towards the Eng. king. He made an extensive journey again in 1538, and finally settled at Montpellier. He is reported to have been imprisoned in the Fleet. His works show that he possessed considerable learning.

Boos, Martin (1762-1825), a Ger. Catholic priest, born in Bavaria. In 1790 he originated a religious movement parallel to that of the Protestant Pietists. In 1806 he settled at Gallneukirchen, and his views found much favour with the Catholic laity and even with many priests. He was persecuted by the Catholics, but himself always remained a staunch Catholic. He was created professor of theology

at Düsseldorf in 1810, and held the post till 1819.

Booster, a small dynamo worked as an auxiliary to a larger one for the purpose of charging, or adjusting the charge, of accumulators in an electrical supply station. It is usually arranged that when the load on the supply dynamo is greatest, the auxiliary dynamos help the accumulators to discharge, but when the call for current is less, the Bs. serve to re-charge the accumulators.

Boot, Boots, or Bootikin, an instrument of torture used in order to extract confession from suspects: It seems to have been first introduced in Scotland, where its use appears to have continued down to the union of the two [illegible] enacted be used to have about t made usually of wood and iron, and was fastened on to the leg of the victim, wooden wedges being afterwards inserted, usually between the B. and the calf, and driven in forcibly with a wooden mallet. Between the blows, questions were put to the sufferer until he either confessed or was mercifully released by unconsciousness. At the same time that this instrument of torture flourished in Scotland, a similar instrument was used in Germany called the 'Spanish B.' Other varieties of the same instrument seem to have been Bs. which were placed on the victim and then excessively heated, and Bs. made wet and then placed on the victim's foot and slowly dried.

Bootan, or Bhootan, *see* BHUTAN.

Boötes, a constellation next in the heavens to the Great Bear. If the [illegible] regarded—as *Plough*, or a regarded as B. was, in fact, termed by the Greeks *Archtophylax*, the 'bear-keeper.' Alpha Boötes, or Arcturus (*q.v.*), is the brightest star in the northern sidereal hemisphere, and Mirœ (ε Boötes) is a beautiful binary of orange and green.

Booth (from a Scandinavian root, seen also in the Icelandic *búa*, to dwell, and the Dan. *bod*) is a covered stall at a fair or market, set up for the purpose of displaying goods for sale. At first a B. was a purely temporary structure, taken down each week after market day, but there was always a tendency for the B. to become permanent. Records, dating as far back as the 12th century, have preserved many complaints lodged against encroachments on the market-place. Thus in 1192 the Abbey of Bury St. Edmunds made a quite fruitless attempt to remove the sheds which citizens had dared to set up without the abbot's consent. That tendency towards permanence is well illustrated by the 'Lucken-Bs.' that grew up in Edinburgh High Street. A burgess became so attached to his own little niche beneath the tn. hall, that the timber planks of his movable stall were gradually replaced by lath and plaster, and even by brick and stone. These unsightly 'krames' or Bs., fastened to the basement of public buildings, have been aptly compared to limpets on a rock. The shopman stood within the unglazed window, the shutter of which divided horizontally in the middle, so that the upper part formed an eaves or awning, and the lower portion a shelf for his wares. The Bs., almost the exact replicas of those of the middle ages, which are still found at Weyhill Fair, Andover, in many parts of France, and throughout Asiatic cities, may be quoted as an excellent example of the vitality of ancient custom. They must have been a picturesque feature of mediæval fairs.

Booth, Barton (1681-1730), an Eng. actor in the reigns of Anne and George I., joined a company of strolling players in his youth. He had considerable talent, and was received in Dublin with great applause. In 1701 he came to London and joined the Drury Lane Company. His most famous part was that of Cato in Addison's play of that name. He was buried in Westminster Abbey. His *Life* was written by Colley Cibber and Victor.

Booth, Charles (*b.* 1840), writer, was born in Liverpool, and is a member of the firm of Alfred Booth & Co., Liverpool, and a fellow of the Royal Society. He has made inquiries into the statistics affecting various social questions, and in his book, *Life and Labour of the People in London*, 1892-97, he deals with these statistics, and discusses the condition of the different classes. Mr. B. is one of the people who have done a great deal towards securing old age pensions, and on this subject he has written the following books: *Pauperism: a Picture; and Endowment of Old Age: an Argument*, 1892, and *Old Age Pensions and the Aged Poor*, 1899.

Booth, Edwin Thomas (1833-93), the second son of the English actor. Junius Brutus B., was born at [illegible] made sev. appreviously to his as not held to have been a very great success, and in fact was by many held to be, in comparison with his father, rather a failure. After the death of his father

he toured California and Australia, and met with overwhelming success. From this time his fame as an actor was never questioned, and he was held to have surpassed his father in many of his most famous characters. On his return from his somewhat prolonged tour, he played at the Winter Gardens in New York, producing Shakespearean plays on a magnificent scale. During the period which followed the assassination of President Lincoln by his brother, John Wilkes B., his career was rather overshadowed by that event, but later, on his reappearance, he was greeted everywhere with enthusiasm in spite of it. Later he built a theatre of his own in New York, but this ruined him financially. He produced here a number of Shakespeare's plays, and by great labour was able to retrieve his fortunes. He founded the Player's Club in New York, and converted his own private residence into a club house. He toured Great Britain in 1880, and again in 1882. He was everywhere received with the utmost enthusiasm. Amongst the parts which he played were: Macbeth, Othello, Lear, Wolsey, Richelieu, and Sir Giles Overreach.

Booth, John Wilkes (1839-65), the younger brother of the above-mentioned actor. He and his eldest brother, Junius Brutus (fils), played together with Edwin Thomas for some time. In 1865, disappointed by his ill-success as an actor, he entered into a conspiracy which had as its ultimate object the assassination of Abraham Lincoln, as a revenge for the ill-success of the Confederates. He shot the president and managed to escape, although he had broken his leg. He was, however, ultimately tracked to Virginia, where, since he refused to surrender, he was shot.

Booth, Junius Brutus (1796-1852), was born in London. He received a fair education, and after trying a number of professions, since he had always shown a great liking for the stage, he appeared at the age of seventeen in some unimportant parts. Two years later he appeared at Covent Garden, and from this time was considered one of the best actors of the age, and Kean's greatest rival. He became famous as an actor in the United States, to which country he migrated in 1821. His most famous characters were Shylock, Richard III., and Lear. His eccentricities during his later years bordered on insanity.

Booth, William (1829-1912), better known as General B., was born at Nottingham. At an early age he came under strong religious influences, and, after having been a local preacher with the Wesleyan Methodists and a minister of the Methodist New Connexion, he severed his connection with those bodies and engaged in evangelistic work. His work was done amongst the poorest and the most degraded people, and he organised them into bands who openly testified to their conversion. He organised successively a number of missions, the most successful of which was the Salvation Army in 1878. The army endeavours to bring religion to those places which the churches cannot or scarcely touch, and to make their converts open witnesses for Christ. The army, in spite of general opposition at its commencement, has met with great and long sustained success. It has spread its field of operations to practically every civilised country in Europe, and the head of the army, 'the General,' was W. B. His wife was of great help to him in his work during her lifetime; she died, however, in 1890. General B. died in 1912, after a painful illness. The world-wide manifestations of sorrow which followed his death testified to the popularity and intensity of the movement he had founded.

Booth, William Bramwell (*b.* 1856), eldest son of the great 'General' of Salvation Army fame, born at Halifax. Educated privately, he began public work in 1874. Chief of Salvation Army staff since 1880; chairman of Salvation Army Life Assurance Society and the Reliance Bank. Married a daughter of the late Dr. Soper of Plymouth, 1882; has two sons and five daughters. All the family join enthusiastically in carrying on the great work started by his father for the relief of the 'submerged tenth.' On his father's death (Aug. 1912) he succeeded him as new General of the 'Army.' Among his publications are: *Books that Bless, Social Reparation, Our Master, Servants of All, Bible Battle-Axes.*

Boothby, Guy Newell (1867-1905), popular novelist, born at Adelaide, S. Australia, on Oct. 13. His grandfather was a Yorkshireman, who emigrated to Australia in 1853. G. B. finally left Australia for England in 1894, and, settling at Bournemouth, soon estab. a reputation as a novelist of the popular type. His novels include: *A Bid for Fortune, or Dr. Nikola as Vendetta;* sev. sequels to this, introducing Dr. Nikola, *The Beautiful White Devil, The Fascination of the King,* etc. He died at Boscombe.

Boothia, Gulf of, a passage of water forming the N. boundary of Boothia Felix. It is an extension of Prince Regent inlet, and is about 310 miles long.

Boothia Felix is a peninsula situated on the N. coast of British N. America. It belongs to the Franklin dist., and its area is about 13,100 sq. m. It was discovered by Captain Ross, 1829-33, and named after Sir Felix Booth, who financed the expedition to the extent of £17,000.

Booth Line of Steamships, founded at Liverpool, 1866; at first carried passengers and cargo between Europe and the Amazon ports of Brazil. In 1882 began running vessels between New York and Brazilian ports. Amalgamated 1901 with Red Cross Line, also manages the Iquitos Lines. The company owns some thirty-eight vessels (*Benedict*, 1894; *Javary*, 1898; *Amazonense*, 1899; *Ambrose*, 1903; *Francis*, 1910; *Aidan*, 1911), and carries the royal mails to N. Brazil. Large ships are being constructed for the fleet. Cheap trips to Spain and Portugal are undertaken by this line. London offices: 11 Adelphi Ter. W.C.

Bootle, a bor. of Lancashire, England, is situated at the mouth of the Mersey, and forms a northern suburb of Liverpool. It is noted for its immense docks along the banks of the riv. It has very large iron and engineering works, several tanneries, jute factories, corn mills, etc. There are three stations, each on the Liverpool overhead electric railway. B. is a fine town, containing many large public buildings. There is a splendid museum, library, town hall, and sev. parks and recreation grounds. Pop. 69,393.

Booton Island, an is. of the Malay Archipelago, separated from the south-eastern ray of the Celebes and the is. of Muna by a narrow strait. It is high and wooded, and produces timber, rice, sago, etc. The pop. are Malays; the area is 1700 sq. m., and the pop. 18,000.

Boots and Shoes. Many and various have been the different forms of covering for the human foot, and many stages of evolution have been passed through from the primitive sandal to the latest products of the boot factories. Not only fashions, but climatic conditions, have always been potent factors in the form of foot-gear: an article fitted for the wear and tear of an arctic expedition would obviously be out of place in a tropical territory. The most elementary form of covering is the sandal; the next is the slipper, in which the straps or lacing of the sandal are discarded; from the slipper the ordinary short shoe is evolved, and from the latter the boot. As it is the most primitive, so naturally is the sandal the most ancient form of foot-covering. In nearly every museum specimens can be seen of sandals dating back to the time of the Egyptians; papyrus was a common material for sandals of that period. In very many parts of the world sandals are widely used to the present day, in India and China for instance, made mostly of grass or plaited straw. In ancient Greece the sandal was used by all classes of the people, long boots being used by hunters only. In Rome there were more varieties: 'solea,' or sandals, were used by the plebs or common people; 'calceï,' or black leather shoes, were worn by members of the patrician class; red leather shoes were reserved for the use of senators. Long boots were worn by hunters, and the 'cothurnus,' or boot with a very thick sole, was used by tragedians on the stage. From very early times up to the present day, the Oriental nations have excelled in the art of making beautifully ornamented and decorated slippers, which are usually worn in those parts of the earth. In mediæval times shoes were worn on the continent of Europe, and by the end of the 14th century the fashion of pointed toes had been carried to such a length that the toes of many shoes of that period project for over a foot, in a long curled-up strip of leather. By the time of Edward IV. the boot proper was *de rigueur* as an article of knightly attire, and continued so until the [illegible] boot was [illegible] II. William I [illegible] tablished the use of the jack-boot for horsemen, and it was used by the British cavalry until quite recently. A somewhat less cumbersome form is still used by the Horse Guards. The jack-boot was superseded in general use by the Hessian boot, which was more sightly over the tight pantaloons in vogue than the former. For use under loose pantaloons the Duke of Wellington introduced the boot which bears his name; though not used now in this country, it is still worn in some parts of the Continent and the U.S.A. After the Wellington the Blucher boot was used, and now the form of boot worn is a short boot just covering the ankles for men's use, and somewhat higher for ladies. In the last fifty years, such strides have been made in boot and shoe manufacture, and there are so many varieties, that some account of the processes through which the boot passes is necessary. Until the advent of machinery, all boots were made by hand; but shoe making as a handicraft is dying out, and in the majority of cases machinery is used for all the processes. The machine-made products do not equal the best of those made by hand in flexibility or endurance; but a more even standard is

attained, and the output attained by machinery is of course much greater. The Blake machine for sewing the soles together marked the first step in the transition from hand to machine made goods, and the machinery invented more recently for welting the boot has rendered the best of the latter practically on a par with the best of the former. The difference between the riveted boot, made by the Blake process, and a welted boot is briefly as follows. A Blake or riveted boot is sewn, or riveted, from sole to insole, at one operation; the upper is at the same time fastened between the two soles. This vertical seam, even if sewn, has a tendency to stiffen the boot unless the leather used is exceedingly light and flexible. If the boot is riveted, it is still stiffer, and therefore this style of boot is used only for rougher wear. When a boot is welted, whether by machine or hand, the upper, insole, and welt are first sewn together with a horizontal seam, extending half through the insole; the welt and sole are then joined by a second operation. The defect of the Blake and riveted boots is by this means eliminated, as the boot bends inwards along the horizontal seam, and is much more pliable. In almost all modern factories human labour is dispensed with as much as possible; in shaping the uppers it is used more than in the rest of the processes. For the upper parts of the boot the thinner and more pliable parts of the skin are used, whilst the thicker portions, such as butts, shoulders, and bends, are used for the sole. The first process in making the uppers is cutting them out according to pattern. The skin is laid upon a bench, the pattern is placed on the top of it, and the leather is cut round the edges of the pattern with a sharp knife. The various pieces of the uppers are then sent to the machine-room. A great variety of machines are here used: stitching machines, button-holing machines, edge-folding machines, barring machines, machines for attaching buttons, machines for trimming the edges of the leather, sewing machines of various kinds, etc. In lace-up boots, a single machine punches the hole, puts in the eyelet, and fastens it. The leathers that have to be seamed or folded are 'skived' first in this room, then they are pasted together and placed under the sewing-machine, and after they have been stitched together the seams are levelled down by a small machine hammer. The thicker leathers used in the bottom parts are cut out from the skin, after being pressed under powerful presses, with variously shaped dies according to the various parts required. The layers of leather required for the heel are first of all nailed together loosely in one machine, and then crushed solid in another, which exerts on them a pressure of several tons. All the various parts of the boot are now sent to the assembling room, preparatory to being started through the making and finishing rooms. The boots which are to be made Blake sewn receive slightly different treatment from those that are to be welted. The Blake last is iron on the bottom, and so the lasting machine permanently tacks the upper to the insole with short tacks, which are clenched when coming into contact with the last. The sole, which has been previously channelled for the thread, is now placed in position, and sewn through with the Blake machine. In the welted boot the upper is not nailed down to the insole, but is held by a lip previously cut in the latter, standing out therefrom vertically. The lip, the upper, and the welt are all three sewn together by a machine, whilst the boot is still on the last. The welt is now beaten out straight, and the sole laid on and held in position by paste, etc., until it is stitched. From this point the treatment of Blake and welted boots is similar, save that the former generally have the nails driven from the inside through to the heel, while the latter have the nails driven through the heel to the sole. After the wearing part of the upper has been stitched by wire, the boot is 'made,' and requires only finishing. In the finishing room the heel is first trimmed into shape, and then smoothed with sandpaper. The sole is treated in the same way, and the edges of both are then coloured and burnished with machine-driven hot irons. In welted boots a machine now makes the prick marks between the stitches, and the bottoms are then coloured, and given a gloss by revolving brushes and pads. The boot is now finished and ready for wear.

Booty means literally that which is seized by plunder or by violent means. That which a robber takes by violence or cunning is B. In a special sense it denotes things taken by land forces in war. In England the High Court of Admiralty has jurisdiction to try any question concerning B. of war which may be referred to it by the Privy Council. Property captured by the naval forces is called 'prize' and forms the peculiar province of the Prize Court of the Admiralty. *See also* PRIZE.

Bopaul, *see* BHOPAL.

Bopp, Franz (1791-1867), a Ger. philologist, studied at Aschaffenburg under Windischmann, and afterwards

stayed successively in Paris, London, and Gottingen, studying the Hindustani languages. He returned to Germany, and in 1821 was created professor of philology and Sanscrit at the university of Berlin. In the following year he was elected a member of the Royal Prussian Academy, and in 1857 he was made an associate of the French Academy. His prin. works are: *A System of Conjugation of Sanscrit compared with those of Greek, Latin, Persian, etc.*, 1816; *A complete System of Sanscrit*, 1820; *A Critical Grammar of Sanscrit*, 1829-32; *A Sanscrit Glossary*, 1830; *A Comparative Grammar of Sanscrit, Zend, Greek, Latin, Lithuanian, Slavonic, Gothic, and German*, 1833-52; *Indo-Celtic Languages*, 1839, etc. He pub. also selections from the *Mahâbhârata*. His work marks the beginning of a new era in linguistic study, as he traced the common origin of the grammar forms and their inflections from composition of Sanscrit, Gk., Persian, and Ger., a thing never before attempted. He did not profess to be the first to show the common origin of the above languages; that was already a matter of comparative certainty. But by an *historical analysis of the forms* which he traced, the materials were furnished for a trustworthy history of the languages compared. He never made any money by his studies, and died in comparative poverty. *See* the biography of F. B. written by Lefmann, 1891, and Benfey's *Geschichte der Sprachwissenschaft*, 1869.

Boppard, a Prussian tn. situated on the l. b. of the Lower Rhine, about 9 m. from Coblentz. It is a very anct. place, possessing traces of Rom. times.

Bora, the Italian name for the violent, cold, dry, N.E. wind which is common in the Adriatic, especially along the Istrian and Dalmatian coasts. The cause of the prevalence of this wind is the sudden increase in barometric pressure which takes place over the plateaux of Europe in winter, thus sending the cold air into the valleys and over the Adriatic Sea. It also occurs in the neighbourhood of Novorossiysk on the Black Sea, and is precisely similar in character to the mistral which is found along the French Mediterranean littoral. It sometimes lasts for over a week continuously.

Bora, Catharine de (1499-1552), the wife of Luther, was the daughter of a Ger. gentleman who placed her in the convent of Nimptschen, near Grimma. Under the influence of the doctrines of the Reformation, she fled with eight of her companions in 1523. Luther placed them in honourable families and took upon himself the ask of getting them advantageously married; he himself married Catharine. This was in the period of his poverty, when his circumstances were disadvantageous, but Catharine proved a true helpmeet in trouble. She survived the death of her husband by several years, and removed from Wittenberg to Leipzig, where she was compelled by lack of means to take in boarders for her living. She afterwards returned to Wittenberg, but removed from there because of the plague, and in going to Torgau suffered an accident on the road, from the effects of which she died.

Bora-Bora, or **Bola-bola**, is an is. in the group called Society Islands, situated in the Pacific Ocean in about 151° W. long. and 18° S. lat. It rises to a height of 2165 ft. Pop. 800.

Boracic Acid, or **Boric Acid**, H_3BO_3, a crystalline substance, found native in the volcanic lagoons of Tuscany. B. A. is also contained in the vapours which are exuded from fissures in the rocks of the same district. The gases are brought into contact with water, which dissolves the B. A. when heated and is afterwards evaporated to recover the crystals. B. A. is soluble in hot water and alcohol, and is of great use as an antiseptic, as it kills micro-organisms without affecting living tissue. It is usually employed in the form of an ointment, being an excellent remedy for the aphthous condition of the mouth in infants. It is also used for ulcerated nipples and as a dressing in surgery. The aqueous solution is effective in cleansing the scalp of scurf, and absorbed in stockings checks excessive perspiration in the legs.

Borage (*Borago officinalis*), a herb with rough stem and small blue flowers. It is cultivated as a garden flower in the United Kingdom and is occasionally found wild. It is used as an ingredient in claret-cup, probably owing to a supposed cooling property. In former times it was esteemed as a household remedy for slight fevers, but there appears to be no justification for such use.

Boraginaceæ, a large order of dicotyledons native to tropical and temperate climates, consisting chiefly of herbs, but occasionally of shrubs and trees. The flowers are hermaphrodite, regular and hypogynous, the calyx has five joined sepals, the corolla five joined petals; there are five stamens, and two superior carpels, generally deeply divided into four lobes with a single style rising between them. The fruit consists of a drupe or four achenes. The species agree in having an insipid juice, and their surface covered with stiff white hairs, whence the name *asperfoliæ*, or rough-leaved, sometimes given to them. Some

species yield a purplish dye, *e.g. Anchusa tinctoria, Lithospermum tinctorium*, and some kinds of *Onosma*.

Boras, a vil. of Sweden, situated 50 m. from Wenersborg. Pop. 3110.

Borassus flabellifer, the Palmyra palm, is a single species of its genus; it belongs to the order Palmæ, and grows all over India and in tropical Africa. It grows to a height of 20 to 40 ft., has fan-shaped leaves about 4 ft. long on an elongated stalk, and a fruit about the size of a child's head. Its uses are innumerable, *e.g.* the leaves form an excellent thatch, and are used as writing-tablets, and woven into baskets and mats, the inflorescence when wounded yields sugar, the fruit is edible when roasted, and the wood is hard and durable.

Borax, sodium biborate, $Na_2B_4O_7$, a substance found in nature in the form of monoclinic crystals, white or greyish in colour, transparent or translucent, with a hardness of 2 to 2½ and a specific gravity of 1·7. B. was known in very early times as being extracted, under the name of *tincal*, from the salt lakes of Tibet. It is also found in California and Nevada, and in the desert of Atacama in S. America. It is manufactured from boric acid, which is fused with half its weight of sodium carbonate, the B. being dissolved out with warm water. On being fused B. forms a globule. It combines on fusing with the oxides of many metals, forming globules of characteristic colours, therefore providing a test for the detection of certain metals. B. is also used in the glazing of pottery and in glass-making.

Borbeck, a vil. in the Rhine prov. of Dusseldorf dist., Prussia, 3 m. N.W. by W. of Essen. Coal is found in the vicinity. Pop. 5000.

Borborus is a genus of dipterous insects of the family Borboridæ. The species are small, dark flies, with wings either clear or absent. They are found in marshy places and on putrid substances, and are always abundant about cucumber frames.

Borchgrevink Carsten Egeberg (b. 1861), a Norwegian explorer, was born at Christiania, and emigrated in his youth to Australia. When the *Antarctic* sailed from Melbourne under Captain Christensen, B. shipped as an ordinary seaman, seeing no other means of going, and was one of the first men to set foot on the Antarctic continent. He made notes of the voyage, and pub. them on his return. In 1898 he was placed in command of Sir George Newnes' Southern Cross expedition, and in 1902 investigated the volcanic disturbances in the W. Indies. *See* the *Report of the Sixth International Geographical Congress, London* (1895, pp. 169-175); and *First on the Antarctic Continent* (1901).

Borda, Jean Charles (1733-99), a Fr. mathematician and physicist, served in both the army and the navy and distinguished himself by the introduction of new methods and instruments connected with the sciences of navigation, astronomy, and geodesy. He invented an instrument for measuring angles with great accuracy, one for measuring the inclination of the compass-needle, and many others; his most important invention was that of the reflecting-circle. He was one of the men of science who framed the new system of weights and measures adopted in France under the Republican gov. He pub. *Description and Use of Circle of Reflection*, 1778, and *Table of Logarithms*, 1804.

Bordarii (from Lat. *borda*, a cottage), or cottarii, were tenants under the feudal system, who, in return for menial services, chiefly field labour, possessed holdings of from one to five acres. They had neither oxen nor plough and were inferior in rank to the villeins, though they were certainly not slaves.

Borde, Andrew, *see* BOORDE, ANDREW.

Bordeaux, a city in the S.W. of France, the cap. of the dept. of Gironde, on the l. b. of the Garonne, 358 m. S.S.W. of Paris. The suburb of La Bastide, which lies on the opposite side of the riv., is connected with B. by a modern stone bridge of seven arches, and a railway bridge. It is one of the first industrial cities of France, and one of the foremost in the cultivation of arts and sciences. The old part of the tn. is distinguished by narrow, crooked streets, but the new quarters are very fine. Among the public squares may be mentioned the Place de la Quinconce, which is ornamented by huge statues of Montaigne and Montesquieu. The public buildings include the old cathedral of St. André, with a detached bell-tower, the church of St. Michel, the theatre, which is one of the finest in Europe, the hôtel de ville, etc. Some of the old gates of the city are still preserved. The university has 2000 students, the public institutions are of a high order, and there is a fine picture gallery. B. is the third port of France both in foreign and coastwise trade, being surpassed only by Marseilles and Havre. The harbour is capable of accommodating 1000 ships of all sizes, and ships of 600 tons can enter at all tides. An additional port has been built at Balacan. Shipbuilding

is a very important industry, whilst the wines of B. have been noted since the 4th century. The chief manufs. are liqueurs, vinegar, tobacco, sugar, etc. The chief exports comprise wines, fish, fruits, jewellery, chemicals, and glass; the chief imports salt fish, iron, coal, pottery, and machinery. B. was the Burdigala of the Roms., the cap. of Aquitania Secunda. It was repeatedly sacked in early times, but had a peaceful time under the Eng. from 1152 to 1453. It is the seat of an archbishop. Pop. 275,000.

Bordelais was formerly a div. of France, bounded on the N. by La Saintonge; on the E. by Perigord [illegible] Bazadais, [illegible] on the W. [illegible] It was principally an ecclesiastical division, having Bordeaux as its chief town.

Borden, Sir Frederick William (*b.* 1847), Canadian statesman, born at Cornwallis, Nova Scotia. He was educated at King's College, Windsor, and afterwards studied at the Harvard Medical School, Boston. He began practice at Canning in 1868. In 1874 he was elected Liberal member of the parliament of the dominion of Canada, and from 1896-1911 was Minister of the Militia.

Borden, Robert Laird (*b.* 1854), Canadian statesman and lawyer. Succeeded Sir Wilfrid Laurier after his defeat on the Reciprocity Bill at the General Election in 1911. He was born at Grand Pre, Nova Scotia. In 1878 he was called to the bar and practised in Halifax, becoming eventually president of the Nova Scotia Barristers' Society. In 1896 he represented Halifax in parliament, but lost his seat in 1904 and was elected for Calreton. In 1908, however, he was returned for both places, and since 1901 has been the leader of the Consevative opposition. He has made several tours in Canada, and in 1909 was touring in Europe and the United Kingdom. Responsible for Canada's offer, in 1912, of three Dreadnought battleships for the home country.

Bordentown, a bor. in New Jersey, U.S., situated on the Delaware, in the co. of Burlington. It is 28 m. by rail or water from Philadelphia, and 6 m. by rail from Trenton It is noted for its iron works and shipbuilding yards. There are also large shirt factories. Pop. 4255.

Bordereau, a French word which means a detailed bill, an invoice of goods, a lading bill, memorandum, etc. It is best known in its English use from the *bordereau* which figured prominently in the celebrated Dreyfus affair of 1894. Dreyfus was condemned on the evidence of this document, which revealed military secrets in connection with the plans of forts, instructions, etc. In 1899 Count Esterhazy confessed to the authorship in the *London Chronicle*. For further particulars *see* DREYFUS AFFAIR.

Borders, The, the name applied to that stretch of country on both sides of the frontier between England and Scotland. The term has three distinct uses, and can be applied historically, geographically, and in a literary sense. The actual boundary between the two countries is a line beginning about 3 m. W. of Berwick, along the line of the Tweed to the Cheviot Hills, which become for some 35 m. the line of demarcation; hence the boundary continues along the line of the Liddel and the Esk for a short distance, and thence to the line of the Sark, which it follows to the Solway Firth. The actual length of the boundary line is 108 m., whilst by taking the distance as the crow flies the distance is not more than 70 m. At the extreme E. of this line is the ter. known as the 'Liberties' of Berwick, an area of about 8 sq. m. which encloses the present tn. of Berwick. The only Eng. B. counties are Northumberland and Cumberland, but on the Scottish side, in addition to the actual B. counties of Berwick, Roxburgh, and Dumfries, there is included in the term also the counties of Selkirk and Peebles, which have always historically been included. The country on the Eng. side of the B. is chiefly bleak and rugged moorland, useful alone for the pasturage of sheep and cattle, but on the northern side the physical appearance presents a vast difference. Here one finds great stretches of fertile land, a country of dales and valleys, possessing a natural beauty and famous for its picturesqueness. The B. country is watered on the northern side by the Tweed, the Whiteadder, Leet, Kale, Jed, Kershope, Liddel, Esk, and Sark, whilst on the Eng. side we find there the rivs. Till, Boumont, Coquet, Rede, and the North Tyne. The history of the B. was for some 1500 years extremely stormy. Nor from the natural position of this ter. can we expect that it should have been otherwise. During the Rom. occupation the original inhab. and the Picts of still further N. were held in check by the Roman walls. The earliest inhab. seem to have been the Brigantes, who held both sides of the B., and were a fierce and warlike tribe. They probably gave considerable trouble to the Roms., but eventually the Roms. [illegible] even at this early date we can regard the B. as a dist. with a distinct history

of its own, since the land between the two walls (Hadrian's and Antoninus's) was never really conquered, and never really held by the Roms. The evacuation of Britain by the Roms. resulted in the B. country becoming the battle ground for the invaders from the N. (the Picts), the invaders from over the sea (the Angles), and the hapless Britons, until finally the whole of the B. country is divided up into the kingdoms of Strathclyde, Bernicia, and Deira. Bernicia and Deira were later united to form the kingdom of Northumbria, a kingdom which stretched from the Humber to the Forth. But this div. brought with it no peace. The country continued to be agitated by the constant warfare between Scot and Angle, and later the Viking, seeking lands for himself, joined in the struggle. The history of the B. between the 6th and the 11th centuries is the history of continual warfare, frequent raids, and much bloodshed. The struggle, which had its origin in the petty quarrels of more or less petty tribes, began, with the development of the tribes into nations, to assume a national aspect. The struggle was now one for the permanent possession of the valley of the Tweed, and we must bear in mind that the ter. of Northumbria for a long time stretched to the Forth. Finally, the line of Scottish kings sprung from the Dalriadan, Malcolm Canmore, snatched Lothian from the hands of the Eng., and laid hands also upon Cumberland, which, though nominally ceded to the Norman kings in the reign of the Red William, was nevertheless a constant bone of contention between the two nations for some very considerable time. The constant warfare and struggles hardly permitted the possibility of a proper development of the country; however, this development had to a very large extent gone on, especially on the Scottish side. The Celtic church had been responsible for this to a very large extent. With the coming of the Celtic monks churches had sprung up in the wilds of Northumberland, and in the fertile valleys and dales of the Scottish lands. Monastery and church dotted the country side, and on the Scottish side grew up the large and flourishing tns. of Berwick, Jedburgh, and Roxburgh. But the death of Alexander III. in 1286 plunged Scotland and England into the war of the succession, and the determined efforts of Edward I. to achieve his dream of a united Great Britain made the B. the battlefield of the two countries. The country was harried and ransacked by both sides; the destruction of Berwick was compensated for by the ravages of Wallace in the neighbourhood of Hexham. Northumberland was practically laid waste, the tns. of Roxburgh and Jedburgh fell into the general ruin, and from that time to the Union (1603) the B. can be said never to have been at peace. Many battles took place here, amongst the more important of which may be mentioned Halidon Hill (1333), Otterburn (1388), Nisbet (1402), Homildon (1402), Hedgeley Moor (1464), Flodden (1513), Solway Moss (1542), and Ancrum Moor (1544)—these in addition to the many battles and skirmishes which took place between the B. families, and which partook more of the character of family feuds. The important defeat of Montrose at Philiphaugh by General Leslie also belongs to the history of the B. The B. were kept in peace more or less by the building of numerous castles, which were to overawe the mosstroopers and the freebooters of the neighbourhood. The B. were during the 15th and 16th centuries administered by wardens appointed respectively by the sovereigns of England and Scotland, the B. at this time being divided into three marches, over each of which ruled practically as sovereigns the Eng. and Scottish wardens. With the accession of James I. (1603) peace on the B. became more possible. James I. even desired to do away with the name B., but the term has always been kept. The castles, however, were dismantled, the garrisons reduced, and gradually the B. became accustomed to peace. A number of fortresses important in B. warfare, remain as pleasant little tns. at the present day, but a number are in ruins.

Such a state of society and the incidents of the peculiar life which the inhab. of such ter. led, found, as was only natural, an outlet in a peculiar literature—a literature which is magnificently unique. The B. ballads sang the deeds of the B. heroes, the men, the breath of whose nostrils was the breath of battle, the heroes who led their little bands of followers to attempt deeds which a larger army would not have dared to attempt. The ballad of *Chevy Chase* is typical of the B. minstrelsy, rescued more or less from oblivion by Sir Walter Scott. But the open life of the Borderer found expression also in the more sentimental side of literature, and the beauties of his native hill and dale did not escape him; he sings of the beauty of his native heath with the same splendour of imagination and with the same poetic spell around him, as he does the deeds of his forbears. Sir Walter Scott rescued the ballad poety, and the traditions of the B. literature find magnificent expression

in James Hogg (the Ettrick Shepherd), John Wilson (Christopher North), and John Mackay Wilson.

Border Town, a small post tn. of S. Australia, situated in the co. of *Buckingham*, about 180 m. S.E. by S. from Adelaide.

Border Warrant, an old form of process in Scots law, used for detaining the person of an absconding English debtor.

Bordighera, a popular It. winter resort. It is situated in Porto Maurizio, Liguria, and has a commanding position on the summit of hills from 600 to 1000 ft. high, overlooking the Mediterranean Sea. Quite a distinct part of it is known as the Visitors' Tn., and here are sev. hotels, etc., and an Anglican church. Great quantities of lemons, flowers, palms, etc., are exported. Rom. remains are found in the vicinity. Pop. 3896.

Bordj-bon-Arreridj, a town in Algeria, situated in the dept. of Constantine, on the high plateau of Madjana. Cattle are reared, and grain is grown in the district. Pop. 8000.

Bordj-Menaiel, a town of Algeria, in the dept. of Algiers and the dist. of Tizi-buzon; pop. 14,000.

Bordone, Paris (1500-71), an It. *painter of the Venetian school*, was a pupil of Titian, and worked in Venice, Trevizo, Augsburg, and France. He was the fashionable portrait-painter of Venice, and in 1538 was invited to France by Francis I., whose portrait he painted. He painted the portraits also of many ladies of the court, of the Duc de Guise, and of many noblemen. He had exceptional talent, and is noted for his fine flesh-tones. His works are found in *Cremona, Milan*, Genoa, Florence, etc. His most celebrated picture, 'The Fisherman giving St. Mark's Ring to the Doge,' is in Venice Academy. In this country we have his 'Daphnis and Chloe' and 'Portrait of a Lady' in the National Gallery, whilst his 'Lady at her Toilet' is at Edinburgh.

Bordure, in heraldry, is a border which surrou[illegible] ally occupies [illegible] sometimes us[illegible] a cadet, and the differencing of cadets by Bs according to fixed rules is still done in Scottish heraldry. A B. componée, that is, divided into sixteen small squares, denotes illegitimacy in Scotland; a B. wavy in England had later the same significance. A great variety is found in Bs.; they are engrailed, invected, wavy, and parted in many ways. A chief is sometimes carried over a B., but not when a mark of cadency. When a coat bearing a B. is impaled with another B. the B. is omitted along the line of impalement.

Bore, or **Eagre**, is a name which is used to designate a phenomenon which occurs in some rivs. in spring-tides. At such times the inflowing water rises to a considerable height and moves along against the current like a wall. It is produced by the fact that the volume of the tidal wave is greater than the riv. can receive without being disturbed greatly. The height of the B. varies from three ft. to twelve ft. The latter height is attained by the B. of the Brahmaputra. Other high Bs. are found in the Hay-choo-foo, and in some rivs. of Brazil. In England Bs. may be observed in the Severn, the Trent, the Wye, and the Solway.

Bore (in fire-arms), *see* GUNS.

Boreas, Gk. for the N.E. wind blowing towards Hellas from the Thracian mts. It is personified in mythology as the son of Astreus and of Aurora, and as brother of Notus, Zephyrus, and Hesperus. He was said to dwell in the cave of a Thracian Haemus. He had a temple in Athens because he destroyed the Persian fleet of Xerxes.

Borecole, or *Brassica accphala*, is derived from *B. oleracea*, the cabbage, a cruciferous plant largely grown in Europe. It has curly leaves, and is valued as a winter vegetable for culinary use. It is also known as Scotch kail, curley greens, Ger. greens, and cow-cabbage.

Borel, Petrus (1809-59), a French writer, was born of a fairly wealthy French family, who had been ruined by the Revolution. He was educated in Paris, and was intended to be an architect. He, however, soon gave up any attempt at making a living by architecture, and became a writer. He was one of the most devoted followers of the Romantic school. He did not, however, prove a financial success as a writer, but a small appointment in the Civil Service placed him beyond want. His chief works are: *Rhapsodies*, 1832; *Madam Potiphar*, 1839.

Borelli, Giovanni Alfonso (1608-79), *a distinguished Italian physicist and* mathematician. He was born at Naples, and in 1649 became professor of mathematics at the university of Messina and later of Pisa. He returned to Messina later, but having taken part in some political affair was forced to retire to Rome, where he lived under the protection of Christina, Queen of Sweden. He was the first to suggest the parabolic path of comets, and he was the founder of the ratio mathematical school, since he attempted to explain the movements of the body on mechanical principles. He wrote works on mathematical, medical, and astronomical subjects.

Borers are beetles which pierce the wood on which they feed and thus do much damage. There are many species contributed by such genera as Anobium and Ptinus.

Boreus, a genus of Mecapterous insects included in the family Panorpidæ, and related to the scorpionflies. They have biting mandibles and the wings are absent. *B. hiemalis* is a native of Europe and America, and is found in the winter months only. It is about one quarter of an inch long, and of a greenish colour with reddish legs.

Borga, or Borgo, a Russian tn. and seaport in the prov. of Nyland, Finland, situated on the R. Borgo, at the spot where it enters a part of the Gulf of Finland. It is about 34 m. N.E. by rail from Helsingfors. The trade is greatly impeded by the shallowness of the bay. Leather and furs are the chief articles of commerce, and there are also manufs. of sail-cloth and tobacco. Here, in 1802, the Chamber of Deputies drew up the Constitution of Finland. In 1809 it was the seat of the Finnish Diet. At one time it was a rich and handsome city, but now it is decayed.

Borger, a tn. and com. in Holland, situated in the prov. of Drenthe, and about 11 m. S.E. by E. from Assen.

Borgerhout, a Belgian tn. in the prov. of Antwerp. Its manufs. are tobacco, candles, and tapestry. There are bleaching and dye works. Pop. 40,150.

Borghese, the name of a celebrated Italian family of Sienese origin, who are first prominent in the history of the republic of Siena at the beginning of the 13th century. One of their number settled in Rome during the 16th century, and the son of this member of the family became pope, with the title of Paul V., in 1605. The family fortunes were much advanced by the pope, who created a nephew Prince of Vivero, and a little later the title of Prince of Sulmona was conferred on the same nephew by the King of Spain. The son of this prince raised the family fortunes to a still higher pitch by his marriage with a daughter of the Aldobrandin family, one of the oldest and richest families of Rome. Camillo Filippo Ludovico, Prince B., married the sister of the Emperor Napoleon in 1803. He was made Duke of Guastalla, and later governor of the provinces of Piedmont and Genoa. He sold the art treasures of his house to Napoleon for a great sum. After the fall from power of Napoleon he retired to Florence, where he lived until his death in 1832. The B. Palace at Rome is one of the most magnificent of the buildings of that city. It contains a very fine collection of pictures, and is now the property of the Italian government.

Borghese, Giovanni Ventura (1640-1708), It. painter, pupil of Pietro da Cortona, whom he helped in some of his chief works at Rome. After his master's death B. completed some of his unfinished paintings. In the church of San Niccolò da Tolentino are his pictures, 'The Annunciation' and 'The Virgin Mary crowned by Angels.' Four scenes from the life of S. Catherine in the church of Città di Castello are considered his finest works. *See* Burckhardt's *Art Guide to Painting in Italy*.

Borghese Palace, one of the most magnificent buildings in Rome, in the Borghese Square, tn. residence of the Borghesi. Built between 1590 and 1607 by Martino Lunghi and Flaminio Ponzio, and known, from its shape, as 'Il Cembalo.' The inner court has two tiers of granite colonnades, with Doric columns below and Corinthian above. In it are huge ancient statues of Sabina, Julia, and Ceres. Its wonderful collection of art treasures was sold by public auction, 1892, by Prince Paolo Borghese. Many of its fine pictures have been removed to the Villa Borghese (now Villa Umberto I.), belonging to the It. state. Pope Leo XIII. acquired the important family archives for the Vatican. The picture-gallery still includes a 'Madonna' of Botticelli, and one by Lorenzo di Credi; two 'Evangelists' by Michael Angelo; four paintings of Raphael (one being 'The Burial of Jesus'); Titian's 'Sacred and Profane Love,' and his 'Three Graces;' Correggio's 'Danaë;' Van Dyck's 'Christ on the Cross' and portrait of 'Maria de' Medici.' There are also canvases of Andrea del Sarto.

Borghese, Villa, the lovely summer residence at Rome of the Borghesi till 1902, outside Porta del Popolo. Built by Cardinal Scipio Caffarelli-Borghese on the Cenci estate, after plans by Giovanni Vansanzio (early 17th century). It has a magnificent park of over 200 ac. Its grand collection of works of art was sold to Napoleon by Prince Camillo Borghese, 1806. Some of these were restored 1815, the remainder are in the Louvre. A new collection of sculptures and pictures was formed later. Among the treasures contained are Algarde's 'Sleep,' and Canova's famous statue of the reclining figure of Pauline Borghese. Both villa and park became the property of the It. state, 1902.

Borghesi, Bartolommeo (1781-1860), an Italian savant, born at Savignano, near Rimini. He was a prodigious student of the documents of mediæval times, and through his

study of these, so ruined his eyesight that he had to give up his study of documents, and turned to numismatics. He was responsible for the arranging and cataloguing of the coins of the Vatican. He retired from Rome in 1821 to San Marino, where he spent the rest of his life, taking some little part in the politics of that republic. He estab. a vast reputation by his great work, *Nuovi Frammenti dei Fasti Consolari Capitolini*, 1820. His works on numismatics also added greatly to his reputation. His complete works were pub. by order of the Emperor Napoleon III., the first vol. appearing in 1862, and the 10th and last in 1897.

Borghesi, Ippolito, Italian painter, native of Naples (*fl.* towards end of 16th or beginning of 17th century), pupil of Francesco Curia. Painted historical and religious subjects; imitated Raphael and Andrea del Sarto. *Chief works: Altar-piece in* chapel of Monte di Pietà at Naples ('Assumption of the Virgin'), and another in San Lorenzo at Perugia.

Borghetto, an It. vil. in the prov. of Verona, situated on the banks of the R. Mincio. It was the scene of a victory of Bonaparte, over the Austrian general, Beaulieu, in 1796. Pop. 500.

Borghorst, a vil. in the German prov. of Westphalia, situated 13¼ m. N.W. of Münster. It has manufs. of cotton goods. Pop. 4000.

Borgia, a family originally from Jabiva in the prov. of Valencia, Spain. The name figures among the Caballeros de la Conquista at the time of the expulsion of the Moors in 1238. One of its members, Alfonso de Borja (1378-1458), was a bishop and private secretary to Alfonso of Aragon, and accompanied that monarch to Naples. This Borja afterwards became pope as Alexander III. and settled a number of his family in Italy. His nephew, Rodrigo de Borja (1431-1503), also became pope under title of Alexander VI., and from that time the prin. seat of the family was in Italy, and the name was changed to B. Before Alexander became pope he had a nun
Rom. girl, who
but whose rea
Cantanei. Th
Lucrezia and
to play important parts, and acquired unhappy renown.

Cesare Borgia, born in April 1476. He possessed unbounded ambition, never-flagging energy, a contempt for all laws, divine or human, extraordinary powers of generalship and administration. A league of all Italy and of most of the powerful European sovereigns was required to check Cesare's rash projects. From birth he was vowed to the priesthood, and he became a cardinal when only seventeen years old. He early resolved to surmount all obstacles to his ambition. He shrank neither from sacrilege nor from murder. He procured the murder of his own brother Giovanni, Duke of Gandia, whom he afterwards succeeded as post general of the Church. Whilst his father, Alexander III., was crushing the feudal power of the barons in the Romagna, Cesare undertook the task of recovering all the fiefs along the Adriatic coast which had ceased to acknowledge the overlordship of the Holy See. He made himself master of the Romagna, Perugina, Siera, Piombino, the duchy of Urbino. He was named Duke of Romagna by the pope, and was about to invade Bologna when he and his father were suddenly taken ill while at a banquet given by the Cardinal of Correto. Alexander died, but Cesare, owing to his strong constitution, recovered. There, however, was an end of his projects. On the election of his enemy Pius III. to the papal seat Cesare surrendered at Naples. He was removed to Valencia and later to Medina del Campa. He escaped from the latter place and went to the court of Navarre, where he was placed in command of the royal forces. He was sent against Louis de Beaumonte, Constable of Navarre, and on the latter refusing to surrender the city, Cesare made unsuccessful attempts to take it. During one of these attempts he was mortally wounded and died in 1507. He was a friend of art, and befriended Leonardo da Vinci. His memory remains in execration, although the people whom he governed regarded him as an upright, se
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up by a fisherman in Naples. When quite young a paper was given him from his mother announcing that he was of noble birth but concealing his real name. On hearing of Lucrezia's wicked deeds he struck off the 'B' from the escutcheon of the duke's palace. His mother saved him from death. Soon afterwards at Lucrezia's instigation a banquet was given to which Gennaro and his friends were invited. The wine was poisoned, and Lucrezia arrested all the guests. Gennaro died after hearing that he was son of Lucrezia. The latter no sooner saw her son dead then she died too.

Borgne, a lake in the U.S.A., situated in the S.E. of Louisiana. It is about 25 m. wide, and touches the Gulf of Mexico on the east.

Borgo is the name given to a number of tns. and vils. in Italy and the Southern Tyrol. It indicates the growth of a tn. or vil. around a castle or castellated rock, the original Borgo. *E.g.*—

Borgo san Donnino, a walled tn. in the prov. of Parma, Italy, situated on the Stura, a tributary of the Po, 15 m. W. of Parma. It has a fine cathedral built in 15th century in the Lombard style. Hemp and silk spinning are carried on, and also glass manuf. It was the scene of the martyrdom of St. Domninus in 304. During the Hohenstauffen dynasty it became an imperial possession, and in 1501 the seat of a bishop. Pop. 10,855.

Borgo san Sepolchro, a town and episcopal see in prov. of Arezzo in Tuscany, 29 m. N.E. of Arezzo on R. Tiber. It is at the foot of Monte Maggiore and is still surrounded by the mediæval tn. walls. Bp. of Piero della Francesca and Raffaello dal Colle. Pop. 3700.

Borgognone, Ambrogio (*d. c.* 1524), an It. painter of the late 15th and early 16th centuries. He was a contemporary of the celebrated Leonardo da Vinci, his real name being Ambrogio Stefano da Fossano. The name B. is probably due to the fact that he was closely associated with the Burgundian school of art. His chief claim to fame lies in the work of decoration which he did for the Certosa, the convent of the Carthusians at Pavia. After his return from Pavia to Milan he continued his work of church decoration, and we find him at a later date painting a series of frescoes for one of the great churches of the town. He is not very well known as a painter, and references to him are very scarce. Two examples of his work at the Certosa are in the National Gallery.

Borgognone, Jacopo Cortesi (1621-76), It. painter, born at St. Hippolite, Burgundy, the son of a minor artist, in whose studio he worked for some years, later entering the army, and finally settling in Florence, being patronised by Prince Mathias of that city. Many of his most famous battle-pictures record the achievements of this patron, and his best work is in the Palazzo Pitti at Florence. He also produced sev. sacred paintings. He spent the last part of his life in a Jesuit monastery, being driven there by a rumour that he had poisoned his wife.

Borgomanero, a small tn. situated in Northern Italy. It is about 22 m. N.W. by N. from Novara by rail.

Borgo Pass is a pass in Austria-Hungary of 4000 ft. in alt., which leads from the S.W. of Bukowinato to Bistritz.

Borgotaro, a small town in Italy, situated 36 m. to the S.W. of Parma. Pop. 2500.

Borgu, an extensive dist. in Africa forming part of the kingdom of Gando in Nigeria, bordered by the Niger, Dahomey, Yoruba, and Gurma. Its surface is, on the whole, level, but there are lofty mts. in the N. Corn, limes, plantains, and yams are grown. Great numbers of cattle are bred. The dist. is divided into numerous states, and Kiama and Wawa are among the chief cities. It is under the gov. of the King of Bussa, and the inhab. are chiefly Baribas. Bussa is its chief tn. The country is very hilly, especially in the N., but the land is fertile, and thickly peopled.

Boric Acid, *see* BORACIC ACID.

Boring, the operation by which a hole of small diameter is made in any direction, usually vertically downwards, through earth, rock, etc. In most instances the object of B. is to procure knowledge of the kind, disposition, and depth of the rocks below the surface. The aim may be purely scientific, as at Leipzig, where a hole 6265 ft. in depth was bored for the purpose of ascertaining the depth and succession of the underlying strata, thus amplifying knowledge secured from examination of faults, outcrops, etc. More often, B. has for its object the acquirement of knowledge of economic value, as in prospecting for minerals. In an area where the existence of beds of minerals is suspected, holes are bored at various points. An indication of the disposition of mineral beds is thus given, and if the number of Bs. be sufficient, a fairly reliable map can be drawn. Even after the existence of minerals in paying quantity is proved, it is necessary to ascertain the nature of the overlying strata, so that the difficulties of sinking shafts can be estimated. It may be said that B. is always a necessary preliminary to mining operations, as it is for civil engineering work, involving extensive excavation or requiring foundations of particular stability. The bore-hole often becomes a permanent well in cases where water or oil rises from the lower strata by its own pressure. (*See* ARTESIAN WELL and PETROLEUM.) Certain salt-beds are most economically worked by introducing water through the bore-hole for the purpose of dissolving the salt, and then pumping the brine to the surface. The apparatus required for B. depends upon the nature of the rock and the depth to which the hole extends. For shallow B. through soft soil augers on the principle of the car-

penter's auger are employed. The tool is mounted on jointed rods; the earth is enclosed by the spiral, brought to the surface and removed. Tools are also used which on turning enclose the earth in a metal pod or cylinder. In working on hard rock, drive-pipes are used. These consist of jointed tubes, the lowermost carrying a sharp steel circular cutting edge, and the uppermost for the time being having a screwed-on surface for hammering. For deeper B. a *drill* is used. This is mounted on jointed rods and operates by percussion and rotation, the rods being slightly turned at each blow. When the weight of the rods becomes considerable, a wooden spring-beam is often used. This consists of a pole about 30 ft. long and tapering to about 6 in. at the small end. The butt is fixed by means of a heap of stones, and it has another support about 10 ft. from the fixed end. This allows a springing up-and-down movement which is communicated to the rods and minimises the labour of the men. The tool is also fitted with a sliding link, as too great rigidity would involve excessive breakage of the rods. The disadvantage of rods is that much time and labour are required to lift them for the purpose of examining the tool or removing the broken rock. The latter operation is carried out by a 'bailer,' a tube with an inwardly opening valve at the bottom. The tube is dashed up and down a few times and the débris brought to the surface. The work of B. is made less tedious by using ropes instead of rods. The drill is kept dropping by its own weight on the rock, and if it is necessary to raise the tool, the winding up of the rope is not a lengthy operation. Lost tools and broken rods have to be fished for by special apparatus. The most elaborate and efficient B. apparatus comprises a diamond drill at the end of a series of jointed tubes. The drill consists of a bit of soft steel set with about eight diamonds of about two carats each. The drill is rotated by an engine geared so that the drill is advanced slightly at each revolution. The rocky core may be lifted for examination, and a stream of water forced [illegible] rising between the

Foster.

Boris, Fedorovich Godunov (1551-1605), Czar of Muscovy, was the most famous member of a Tartar family now extinct. In his youth he was at the court of Ivan the Terrible, and in 1571 he married Maria, the daughter of Ivan's favourite, Malyata Skurator. He was raised to the rank of boyar on the marriage of his sister to the Tzarevitch Theodore. When Theodore succeeded to the throne in 1584, B. was appointed guardian, with Nikita Romanovitch. A rebellion in favour of the younger son of the Czar, Demetrius, was frustrated by B., and on the occasion of Theodore's coronation the former was loaded with honours. The death in 1584 of his co-guardian left B. the most powerful personage in the kingdom. A conspiracy against him of the most prominent nobles, jealous of his success, was an utter failure, and only enhanced his power. From this time onwards B. was the ruler of Russia, and the direction of all affairs was in his hands. His general policy was always in favour of peace, and he showed great judgment in his attitude towards foreign powers. He encouraged Eng. merchants by exempting them from tolls, and maintained an independent attitude towards Turkey. He created the first Russian patriarchate at Moscow, thus giving autonomy to the Russian Church; and he fortified numbers of tns. on the N.E. and S.E. borders, to check the depredations of the Finnic and Tartar tribes. The 'ukaz' of 1587 forbade the peasants to change their masters; its object was to obtain revenue, but its effect was to render the peasants veritable serfs. On the death of Theodore on Jan. 7, 1598, B. was unanimously elected czar by the Zemsky Sobor. He continued his former policy, and was undoubtedly one of the greatest of Muscovite czars. His chief fault was [illegible]ness.

[illegible] in Russia,
[illegible] R. Voronu,
[illegible]'op. 18,000.

Borisov, a dist. and tn. in Russia, 50 m. N.E. of Minsk. Pop. 18,200.

Borisovka, a town in Russia in the gov. of Kursk, 30 m. from Byelgorod. There are tanneries and steam mills, and a trade in corn, leather, etc.

Borja, an ancient town of Spain, situated in the prov. of Saragossa. It has manufs. of soap, woollen materials, and brandy. B. was the cradle of the Borgia family. Pop. 6500.

Börjesson, Johan (1790-1866), was a Swedish poet and dramatist, whose work may be divided into two distinct categories. In his youth he wrote much lyrical poetry, and may be termed the last of the Phosphorist school. In 1820 his inspiration appeared to have deserted him, and he pub. nothing until 1846. In that year he pub. the first and best of his dramas, *Erik XIV.*; this poem is distinguished by its vigour and movement, allied with keen characterisation, but he never again produced

anything to equal it. He was chosen a member of the Academy in 1861. His dramas include, besides *Erik XIV.*, *Erik XIV.'s Son*, 1847, and *Solen Sjunker*, 1856; his best known lyrical work is in *Blommor och Tårar hå en Dolters Graf*, 1854.

Borkum, the name of an is. in the N. Sea, belonging to Germany, and in the prov. of Hanover. It is one of the E. Frisian group, and is situated between the eastern and western arms of the Ems estuary. The is. is about 5 m. long, and half as wide. There is good pasture land for cattle, and numerous seabirds find a breeding place upon it. During the summer months it is very much frequented by visitors, who find that good sea bathing is to be had. Pleasure steamers go there daily from Emden, Hamburg, and other places.

Borlase, William (1695-1772), antiquary; M.A. Exeter College, Oxford. Presented in 1722 to a living near Penzance to which the vicarage of St. Just was added in 1732. He pub. in his *Philosophical Transactions* an essay on Cornish diamonds, and was made an F.R.S. in 1750. He subsequently produced several works, including *Cornish Antiquities* (1754). He was made an LL.D. in 1706. He presented collections to the Ashmolean Museum.

Bormio, a tn. in the valley of the Adda, Sondrio prov., Northern Italy. It is nearly 5000 ft. in alt., and noted for its hot sulphur and saline springs. Pop. 1975.

Born, Bertrand de, a famous troubadour, was born in Périgord about the year 1140. He was a notable figure in the struggle of King Henry II. of England, and his sons, during the latter part of the 12th century. The date of his death is unknown, save that it was before 1215. More than forty of his poems have survived, ranging from love songs to biting satires.

Borna, a Ger. tn. on the R. Wirha, 17 m. S.E. by rail from Leipzig. Its manufs. are shoes and boots, and pianoforte felt. There are iron works, and peat cutting forms a big industry.

Börne, Ludwig (1786-1837), a noted German political writer and satirist, was born at Frankfort-on-Main, where his father, Jakob Baruch, carried on a Jewish banking business. He studied medicine at Berlin under a physician named Markus Herz. He fell in love with his patron's wife, Henriette Herz, to whom he addressed numerous letters pub. in 1861. From 1807 he studied constitutional law and political economy at Heidelberg and Geissen, and took his doctor's degree at the latter university. He was made police actuary on his return to Frankfort in 1811, where he remained until 1814. He became a journalist, and edited the Frankfort Liberal newspaper, and the *Staatsristretto* and *Die Zeitschwingen*. In 1818 he became a convert to Lutheran Protestantism, changing his name from Löb Baruch to Ludwig Börne. From 1818-21 he ed. *Die Wage*, which was suppressed by the police authorities. After the July Revolution in France, 1830, he went to Paris expecting to find the newly constituted state in accordance with his own ideas of freedom. He was, however, disappointed. His views are fully developed in his *Briefe aus Paris*, in which he reproaches the Ger. people with every kind of vice and folly. He died at Paris of consumption. He was a bitter enemy of Heine. His works, though fragmentary, are remarkable for brilliancy of style, and for a thoroughly Fr. vein of satire. His most important publications are: *Briefe aus Paris*, *Börnes Briefe an Henriette Herz*, *Dramaturgische Blätter*, *Denkrede auf Jean Paul*.

Borneo, a great island in the Malay Archipelago, is, next to Australia and Papua, the largest island in the world. It is about five times as large as England and Wales, and larger than the Austrian empire by 30,000 sq. m., having an area of 284,000 sq. m. Its boundaries on the N. and W. are the Gulf of Siam and China Sea; on the E. the Sea of Sulu and Macassar Strait, and on the S. the Sea of Java. B. is politically divided into four parts, viz. (1) British N. B., having an area of 31,000 sq. m.; (2) Brunei, also a British possession, with an area of 3000 sq. m.; (3) Sarawak, another British possession; and (4) a Dutch possession, B. Of these the most valuable portion is Dutch B. The Dutch possessions have a total area of about 200,000 sq. m. Generally speaking, the country is mountainous, with wide plains and low, marshy shores. There is no distinct nucleus where the mt. ranges branch out in different directions. The chief ranges are (1) the Kapuas, dividing Dutch B. from Sarawak, and stretching in a westerly direction; (2) the Schwaner Mts., which lie S. of the Kapuas; (3) the Müller chain, between the eastern parts of the Madi plateau and the Kapuas. The Madi plateau is between the Kapuas and Schwaner ranges. There is also a chain running eastward from the central mts., and terminating in the promontory known as Cape Kaior. The coasts, which are low and marshy, are rendered dangerous to navigation by numerous inlets and rocks. There are no deep indentations. The mt. system has not yet been fully explored, but gold.

diamonds, quicksilver, platinum, coal, and lignite have been found in abundance. The mt. framework of the whole is. consists of eruptive and crystalline rocks of high antiquity. Denudation by tropical rains has largely been responsible for the corrugated and crinkled appearance of the country in the S. The rivers are numerous, and afford good means of communicating with the interior, some of them being navigable for hundreds of miles. They are useful both as highways and as lines along which run the main arteries of pop. The chief rivs. are the Sarawak, Barito, K
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a rich, alluvial dist., but its course is impeded by rocks, waterfalls, and rapids. The rivs. of the S. are waters of capacious drainage. The chief drawback of the river system is that, on nearing the coast, many of the streams overflow, and form marshy and unhealthy regions. The intense heat of the tropical region is here
n winds, and the
to health, except
Almost every wind brings rain, and as the is. lies within the region of the equatorial downpour, the vegetation is of the richest and most luxuriant kind. One of the chief trees is the sago-palm. The chief trade is in sago, bees'-wax, edible birds' nests, camphor, trepang, and tortoise-shell. In exchange, Britain sends cotton goods, hardware, and opium. The cap. of E. Dutch B. is Banjermassin, which is the largest tn. of the is. Pop. 30,000. Elopura, the cap. of British N. B., is situated on a fine harbour. Coal is plentiful in the neighbourhood, and the sago palm, sugar cane, and tobacco plant flourish. Brunei, the cap. of the prov. of Brunei, stands on the riv. of the same name. The riv. is very wide at this point, and the tn. may be said to be literally in the river. Sarawak, or Kuching, is a substantial town with much trade. It has a pop. of 20,000. Pontianak is the cap. of the W. region under Dutch rule. The pop. of B. consists of three classes: (1) Dayaks or Dyaks, who are the original inhabs.; (2) the Mohammedans or Malays; and (3) the Chinese. The Dayaks live chiefly in the interior, and are employed in tillage, collecting of gutta-percha, gums, gold-dust, and wax. The Malays dwell on the coasts as traders and boli- ilors. The Chinese, chiefly from Canton, have penetrated far into the interior. They engage in trade and mining, and are unwearied in their efforts to make money, and then return to their native country. They have endeavoured to live as independent republics under chiefs chosen by themselves.

Borneo Camphor is obtained from a huge tree, native of Sumatra and Borneo. It is deposited in fissures in the wood, and these fissures have to be opened to obtain it, but it can also be obtained by the action of reducing agents.

Bornhem, or Bornheim, is a prov. and a com. of Belgium with a pop. of about 5000. The name is given also to a few small places in Germany.

Bornholm, is an is. belonging to Denmark, situated about 22 m. S.E. of Sweden, in the Baltic Sea. It is 24 m. long, and 16 wide. Its coast is very rocky, and the interior is hilly, especially in the N., where the cliffs reach a height of nearly 150 ft. The soil is fertile, and flax and hemp are grown, also oats. There are good pasture lands for cattle. Sev. quarries are in the neighbourhood from which are obtained good building stone, marble, and limestone, also a fine porcelain clay is worked. The industries are weaving, the making of clocks and watches, and earthenware. There are large distilleries and breweries. Rönne is the chief tn., and there are a few small tns.: Neksö, Hasle, Svanike, Allinge, and Sandvig.

Bornia, a genus of fossil plants, occurs in the coal formation. It belongs to the Equisetales, and is now included in the genus *Archæocalamites*. The best known species is *B.*
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m is
accomplished by looking along two or more straight edges or a range of poles set up at regular intervals.

Bornu, a Central African sultanate W. and S. of Lake Chad. It is a flat country with few elevations. The soil is chiefly sterile. The regions adjoining rivers are formed by alluvial deposits and are very fertile. Climate is hot and unhealthy. Chief products are indigo, cotton, and ground nuts. Pop. consists of various tribes, of which the chief are Kaniri, Kanembo, Tibbi, Musgo, Manga, and Haussa. The cap. is Kuka or Kukua (60,000). Area 57,000 sq. m. Pop. 5,000,000.

Boro Budor, which means 'The Great Buddha,' are the ruins of a very wonderful Buddhist temple, situated in the middle of Java. It is to the W. of Surakarta, and close to the junction of the Progo with the Ello. It is estimated to be quite the most remarkable and splendid specimen of Buddhist architecture in the world. The religion of Buddha was brought into Java in very early times, and according to the chronicles of the

Javanese, this temple was built in the 7th century. No inscriptions can be found concerning it, but it has been asserted that its completion would have been about 1400. It stands rather high, and was erected on volcanoes. It is a square pyramid, in circumference at the base, 2080 ft., and in height about 118 ft. An immense cupolo surmounts the building. There are altogether seven walls, each very ornamented with statues, etc., and they are built like the steps up a *hill*. Upon the outside there are 400 niches, with a huge statue of Buddha in each, and between these are carvings, and bas reliefs, etc.

Borodino, a Russian vil. situated on the Kolotscha R., 79 m. from Moscow. Very near this place a famous victory was gained over the Russians by Napoleon's army in 1812. The Russians lost 40,000 out of 121,000 men, and in Napoleon's army, 32,000 men were lost out of 130,000. The Czar Nicolas I. caused a monument to be erected on the battlefield in memory of the Prince Bagration.

Boroglyceride, a mixture of boric acid with glycerol.

Boron, *a non-metallic chemical element*. It occurs in nature in the form of boric acid and its salts. The element when separated appears as a brown powder, which burns to form the trioxide B_2O_3. When heated with sulphuric acid it oxidises to boric acid. It combines directly with fluorine on contact, and with chlorine and bromine on heating. The chloride is a colourless fuming liquid which readily decomposes in the presence of water, and the bromide has much the same properties. The sulphide also can be formed by direct union of the two elements on heating, and is also rapidly decomposed by water.

Bororos, the name of a people of S. America, who were conquered by the Portuguese about the middle of the 17th century. They inhabit the states of Matto Grosso and Goyaz in Brazil, and are, according to some authorities, the parent stock of the Patagonians. They are of very high stature, the average height being about 6 ft. 4 in. Their religious beliefs are of a primitive nature, and their state of civilisation is not very advanced. They compare a man's soul to a bird, which flies away temporarily during sleep, returning on awakening.

Borough. The word B. is derived from Saxon *burh*, meaning a walled or fortified place, and although the later and modern significations of the word are intimately bound up with associations of self-government, the ancient connotation is essentially that of a place of defence. Such places comprised the fortress-girdled metropolis of each component kingdom of the heptarchy, walled seaports, border fortresses, and fortified 'tuns,' or townships, on the royal demesne. The genesis of the *burh* is not to be sought in any Roman source, and all the evidence at hand goes to show that the development of English Bs. is exclusively related to the peculiar conditions of our national life. It is true that the Roman *coloniæ* and *municipia* reveal in some sort the idea of self-government, but the powerful central organisation of the imperial government of ancient Rome and its military spirit were inconsistent with any true conception of local government. In Britain, when the great fiefs or feudal baronies became hereditary, any local power that might have existed became absorbed in the privileges of the great barons. Thereafter burghal life in England is a slow growth orizinating in charters of incorporation or grants of liberties, comprising privileges rooted in custom, bought of the overlord at a heavy price in money and developed through the powerful organisations of merchant and craft gilds. Finally, the term B. becomes almost synonymous with the statutory creation of the 'municipal B..' denoting a place to which certain wide powers of self-government are accorded and exercised through the characteristic hierarchy of mayor, aldermen, and burgesses. Before the Conquest there is hardly any trace of municipal organisation, the king's sheriff, through the medium of the various grades of local moots, or courts, exercising the chief judicial and financial functions. The *township*, the smallest unit in the political system, consisting merely of a group of allodial landowners and held together by a community of interests, undoubtedly contained the germ of many of our Bs. Others grew out of a collection of such townships, and most of the remainder had their beginnings in the neighbourhood of some castle or under the walls of the monasteries. The chief magistrate of the *burh* was the *town-reeve*, or, in ports, the *port-reeve*. The men of *the burh* met together both for the purposes of commerce and defence, and by a system of mutual pledges (called *frank-pledge*) answered for the good behaviour of every man in the *burh*, the paramount ownership of the great feudal lords being preserved by their power to appoint the reeve and the exaction of an arbitrary tallage. The king's supreme ownership was secured through the jurisdiction of the hundred, from which

the *burhs* soon obtained exemption, and the shire-gemot, to which they remained more or less subject until the evolution of that body into the county council and county court of to-day. Even before the Conquest a few big towns had acquired the privilege of compounding for the arbitrary taxes or tallages of the king's sheriff by paying a fixed rent.

After the Conquest, Bs. or towns became divided into those which were included in the royal demesne and those which were held by barons, and [illegible] tance thro ag or over le) of char privi- lege: com- prised a right of independent jurisdiction, self-assessment, the right to have a *hanse*, or merchant gild, the free election of reeves, *infangenthcof*, or local jurisdiction, over thieves, exemption from tolls, and the commutation of the profits of fairs and markets and the arbitrary assessments by the sheriff of individual burgesses (*q.v.*) for a perpetual fixed rent from the whole B., called the *firma burgi*. Those contributing towards the *firma burgi* were said to hold their tenements by burgage tenure, which tenure still exists, but without its older incidents. By the time of Henry III. most of the large towns had obtained a distinct recognition by the king of their privileges and immunities. Charters were granted to the 'fully qualified members of the township,' and from having no powers of self-government, Bs. soon became especially adapted through the organisation of the gild system, to the functions of municipal government. Separate jurisdictions, and the obligations of feudal tenures which bound so many of the burgesses to some paramount tenant-in-capite, or great baron, disappear after incorporation, and the substitution of the *mayor* for the *reeve* heralds the advent of an independent local community. The municipal government of Bs. from and after the grants of incorporation by the Plantagenets was developed partly by the possession of corporate property, but arose chiefly from the spirit of corporate unity and mutual responsibility that permeated the *gilds*. These gilds (or 'guilds') were voluntary associations designed for the protection of trade, for religious purposes such as burying the dead and holding annual feasts, for mutual protection and keeping the peace, and for social purposes. The *merchant gild*, the object of which was to regulate trade and which conferred on its members exclusive rights of trading free from toll, soon became the most predominant form of gild, and in many cases became identified with the governing body of the B. When Bs. become recognised by the crown, their bye-laws (*burh-laws*) acquire a binding force. Later, in the reign of Edward III., the powers of the merchant gilds are absorbed by the *craft gilds*, or gilds of craftsmen engaged in a particular craft in a particular B., associated for the maintenance of a high standard of excellence in their particular craft. Whether the rise of the craft gilds was due to the oppression of the artisans by the merchant gilds is doubtful, present-day opinion averring that civil quarrels were between burgers and non-burgers, and not between master and artisan. Ultimately the place of the craft gilds is taken by the merchant companies of the 17th century, and the powers of self-government revert to the close corporation of the B. composed of the mayor, aldermen, and councillors. From the middle of the 13th century the general tendency in the development of Bs. is to vest the governing powers in a mayor chosen by the whole body [illegible] and alder acquired the power to elect the mayor themselves, united themselves into a close corporation, and managed to get charters of incorporation granted to themselves to the exclusion of their fellow burgesses. This restrictive tendency increased, and after the close of the 15th century freemen were excluded by the close corporation from elections, and the corporation assumed the ownership of the B. property and even controlled the election of members of parliament, a power which was found especially useful to the crown. The burgesses in almost every case had no part in the election of the governing body of the B., and the members of the council almost invariably subordinated their duties to their own personal interests. This state of things came to an end with the passing of the Municipal Corporations Act of 1835. That act, which introduced the term 'municipal B.,' reformed the larger corporations and gave new powers of self-government to such places, whether parliamentary Bs. or not, as were deemed 'municipal Bs.' In connection with parliamentary representation, constitutional historians observe that the word B. becomes for a time associated with a place, whether incorporated or not, which usually returned a member to parliament. Where the B. had no charter, that distinctive feature of Bs. was preserved by the assump-

tion that every parliamentary B. must have had a charter at some former time, or was entitled to the privileges of incorporation by prescription (usage). The Reform Act, [illegible] rotten Bs., [illegible] of B. to its [illegible] A B. now means a town or place subject to the Municipal Corporations Act, 1882. The crown still retains the prerogative of incorporating Bs. by royal charter. A B. possesses a common seal and a council consisting of a mayor, aldermen, and councillors. The councillors are elected by the burgesses, and the mayor and aldermen by the council. The mayor is an *ex officio* magistrate for the B., and sometimes receives a salary. The mayor serves one year, the councillors one year, and the aldermen three years, one-third of the aldermen retiring annually. Bs. of over 50,000 inhabitants can be turned into administrative counties, and are not then under the power of the county council. The Local Government Act, 1888, converted several of these large Bs. into administrative counties. Some Bs. have a court of quarter sessions, presided over by a judicial officer called a recorder. A B. is but little controlled by the central government, but the sanction of the Local Government Board is required for loans secured on the B. rates, and the property of the B. may not be alienated without the consent of the crown. A B. possesses wide powers of making by-laws for the good rule and government of the B. and for the suppression of nuisances, besides all the usual powers of an urban or rural district council. As to the qualification of a burgess, *see* BURGESS. The word burgh as used now is appropriated to Scotch Bs. or burrows, as to which *see* BURGHS. *See also* LOCAL GOVERNMENT.

Borough, The, usual term to designate the borough of Southwark, a part of London to the S. of the Thames, an ancient district containing many places of interest. Chief among these is St. Saviour's Cathedral, one of the oldest churches in London, containing the graves of many celebrated Elizabethans, such as Massinger, Beaumont, and Fletcher. Here also is Bankside.

Borough, The, title of a poem by George Crabbe.

Borough (Burrowe, Borrows), Stephen (1525-84), English navigator; went on the expedition under Willoughby from the Thames to find a northern passage to Cathay and India, 1553, this being the first voyage of the English to Russia. B. was master of the *Edward Bonaventure*, with Chancellor as chief pilot. Separated by storms from the other two vessels, he sailed on into the White Sea, being first to find and name North Cape. His epitaph at Chatham states that he 'discouered Moscouia by the Northerne sea passage to St. Nicholas' (Archangel). In a second expedition in the *Serchthrift*, 1556, he discovered Kara Straits between Novaya Zemlya and Vaygach Island. Probably about 1558 he went to Spain, and was the first to propose a translation of Cortes' work, known in English as Eden's *Arte of Navigation*, 1561. B. went on another expedition to Russia in 1560, 'the seventh voyage of the Merchant adventurers to Moscovy' (Hakluyt). In 1563 he was chief pilot and one of four masters of the queen's ships in the Medway. Some of his records of his voyages appeared in Hakluyt. *See* Hakluyt's *Voyages*, 1582; *Navigations, Voyages, etc.*, 1599, vol. i.; Hamel's *England and Russia* (Leigh[illegible] translation) 1854.

Borough, [illegible] [illegible]glish navigator [illegible] of Stephen (*q.v.*). He was an ordinary seaman on the *Edward Bonaventure* on the first voyage to Russia, 1553. Afterwards he made many voyages to St. Nicholas. Later he transferred his services from the merchant adventurers to the crown, but the actual dates are uncertain. In 1570 B. fought against pirates in the Gulf of Finland. Commanding the *Lion*, he accompanied Drake in the Cadiz expedition, 1587; but got into trouble for questioning the wisdom of the attack on Lagos. He commanded the *Bonavolia* in the Armada fight, 1588. B. is author of *Instructions for discouery of Cathay Eastwards for Pet and Jackman*, 1580; and of *Discourse of the Variation of the Compas*, 1581. Some of his charts are preserved at the British Museum and at Hatfield. Consult Barrow's *Life, Voyages, etc., of Drake*, 1843; Fox Bourne's *English Seamen under the Tudors*, 1868; Camden Society's *Leicester Correspondence*, 1844.

Boroughbridge, parish and market tn. in the West Riding of Yorkshire, Ripon div. It is on the Ure, 6 m. S.E. by E. of Ripon on the N.E. railway. Pop. 1000.

Borough-English, a custom in some parts of England by which lands and tenements held in ancient burgage descend to the youngest son instead of to the eldest, wherever such custom obtains. It still exists in many cities and anct. bors. and the adjoining dists.

Borovichi, a tn. of Russia, on the R. Msta, 98 m. E. of Novgorod. Pop. 10,912.

Borovsk, a tn. of Russia, 49 m. N.N.E. of Kaluga, and a few miles S.

of Moscow. In its vicinity is a 15th century convent, formerly one of the richest in the world. Pop. 10,191.

Borrera and **Borreria** are names which were given to two genera of plants in honour of the botanist William Borrer. The former genus comprised several lichens, the latter some plants of the order Rubiaceæ which now bear the generic name Spermacoce. *Borreria poaya*, a native of, Brazil, has blue flowers, and its roots are sometimes substituted for ipecacuanha.

Borromean Islands, a group of four is. on the W. side of Lake Maggiore, off Baveno and Stresa, N. Italy. They are situated in the western arm of the lake, and are named after the ancient family of Borromeo. They were constructed by Count Borromeo (*d.* 1690), who built terraces and converted the islands into beautiful gardens. The two most celebrated islands are Isola Bella and Isola Madre. On the W. side of Isola Bella stands a château of the Borromean family. Isola Madre is the largest, and has long terraces and an old palace. Isola de Pescatori contains a fishing vil. of about 200 fishermen.

Borromeo, Carlo, saint and cardinal of the Roman Catholic Church, son of Gilberto B., Count of Arona, and Mary de Medici, was born at the castle of Arona, on Lake Maggiore, in 1538. He studied civil and canonical law at Pavia. He took his doctor's degree in 1559. When his uncle became pope, Carlo was made protonotary, created cardinal deacon, and raised to the archbishopric of Milan. He founded an academy of learned persons, and pub. their memoirs as the *Noctes Vaticanæ*. On the death of his brother he was advised by his friends to marry so that the family title might not be extinguished on his death. On the death of Pius IV., Carlo began the reformation of his diocese. He made reforms in the services and decorations of the churches, built seminaries, colleges, and communities, for the education of young persons intended for Holy Orders. Sev. religious orders opposed him in these reforms, the most vigorous being that of the Brothers of Humility. A plot to assassinate him was formed by this society, and he only escaped death by a miracle. During the plague at Milan in 1576 he helped the sick, buried the dead, distributed money, and avoided no danger for the sake of the suffering. He died at Milan in 1584. He was immediately enrolled among the saints, but was not canonised until 1610. Besides the *Noctes Vaticanæ* he pub. many homilies, discourses and sermons.

Borromeo, Frederico (1564-1631), nephew of St. Carlo B., was made archbishop of Milan in 1595, after having been made a cardinal eight years before. During a plague which ravaged the city during his episcopate, he proved a worthy emulant of his uncle, and distinguished himself by his piety and self-sacrifice. His noble life is commemorated in Manzoni's *I Promessi Sposi* (1826). He was the founder of the Ambrosian Library, for which he collected nine thousand manuscripts.

Borron, Robert de, Fr. writer of the 12th century. He collaborated with *Hélis de B., who was either his brother or a near relation, both of* them being born in England. Henry II. employed them to translate the stories of the Round Table into Fr. prose and Lat. Among the stories they trans. were those of Merlin, Lancelot of the Lake, and the Holy Grail. These were all put into Fr. verse by other poets of the time, and new translations were made as the language altered, but they still bore the name of Robert de B. These romances form a part of the Bibliothèque bleue.

Borrow, George Henry (1803-81), philologist, was born at E. Dereham, Norfolk, where Cowper had been buried. An account of his early life must be gleaned mainly from his works, most of which are more or less autobiographical, the chief difficulty being to distinguish where fact ends and romance begins. In *Lavengro* he tells us that he was of Cornish descent on his father's side, while his mother belonged to a family of Fr. Protestants, who were obliged to leave their country for their faith's sake, and settled, with other Huguenots, in E. Anglia. His father 'adopted the profession of arms,' and was sent by the Duke of York to instruct the young civics. His position, however, did not permit the maintenance of two establishments, and so his family had to accompany him to very many tns. Such a system was not favourable to any solid education, and that of young George seems to have been very desultory, the longest time being spent at Edinburgh, where he became a student at the High School. However, during these changes, he managed to acquire a variety of information; for example, while in Ireland, he acquired a fair knowledge of Erse. He speaks of himself as being a very backward boy, and says that his slow development made his parents fear that he would never be a bright child. At the age of seventeen, he with his parents settled down at Norwich. Here he was articled to a solicitor; he says of him 'the prince of all Eng. solicitors, for he was a

gentleman.' Here his philological tastes were encouraged. He studied Welsh, and learnt to read and appreciate the works of 'Dafydd ap Gwilym,' whom 'I have always considered the greatest poetical genius that has appeared in Europe since the revival of literature.' William Taylor, the apostle of Ger. literature in Eng., in 1821, wrote to a friend, 'A Norwich young man is with me construing Schiller's *William Tell*, with the view of translating it for the press. His name is George Henry B., and he has learned Ger. with extraordinary rapidity. Indeed, he has the gift of tongues, and though not eighteen understands twelve languages, Eng., Welsh, Erse, Lat., Gk.,



GEORGE HENRY BORROW

Heb., Ger., Danish, Fr., It., Spanish, and Portuguese.' On the death of his father, in 1824, which seems to have coincided with the expiration of his indentures, B. determined to give up his work in Norwich, and, with his knowledge of languages as his capital, proceeded to London, to seek fame and fortune as a writer. He became a hack writer in the firm of Sir Richard Phillips, who was undoubtedly the original of the vegetarian publisher in *Lavengro*. In 1825 appeared his first work, *Faustus; a translation from the German*, and in the next year a miscellany from the Danish, both of which are crude, and both of which show the influence of William Taylor. In 1826 also appeared his *Romantic Ballads*. The chains of London galled him, however, and in that year he threw them off to wander through the country as tinker, gipsy, ostler, or whatever offered, walking through the Eng. countryside, consorting with those who, like himself, felt the call of the wild. A half fanciful, half authentic account is found in *Lavengro* of his fight with the 'Flaming Tinman' of Isopel Berners, and gipsy life. Later, he extended his travels to the Continent, walking through parts of France, Austria, Italy, and Russia. He was in Paris during the 'three days'; later we find him at St. Petersburg, confining his studies in the main to living languages. From 1833-35 he was in Russia, superintending the translation of the N.T. into Manchu, the court language of China. In 1835 he published his *Targum*, a collection of translations from thirty languages and dialects. Returning to England he accepted the somewhat unlikely position of an agent to the Bible Society, and travelled through Spain, Portugal, and Morocco from 1835-39, his adventures being admirably described in his own work. In 1840 he married Mrs. Clarke, a Norfolk lady, and settled down to a life of literary labour on her estate on Oulton Broad. To his estate he welcomed his old friends the gipsies, and it became a regular camping ground. There he wrote the works which brought him fame, and there he lived until his death in 1881, his wife having predeceased him in 1869.

In 1841 he had pub. the *Gipsies in Spain*, followed in 1843 by the *Bible in Spain*. The first, by its extraordinary knowledge of a mysterious race, and the second, by its wonderful pictures of the country, took the reading world by storm, and placed B. in the foremost rank of living writers. His popularity was too great to last. *Lavengro* and the *Romany Rye*, its sequel, came far below the expectations aroused by the earlier work. It was not that the author was at fault, but that he did not write to suit his public. *Lavengro* is undoubtedly greater than the earlier books, even if *Romany Rye* is weaker. The fact was, that they were too much for the squeamish taste of the time. *Lavengro* is a book of the open air—notice the progression in the sub-title 'Scholar, Gipsy, Priest,'—it is the raciest of books; it has B.'s most striking passages. Yet it wrecked his popularity. The reason is given in the criticism passed on it, 'It is an epic of ale.' B. was then in the state in which he looked with contempt and fierce distrust on practically everybody who was not a tinker, a tramp, or an ostler, and the book seemed a slap in the face to ordinary, decent, mid-Victorian society. The reaction was intensified by the sequel, and B. never regained

his popularity. His later books were certainly more feeble than his earlier; the *Sleeping Bard*, translated from the Welsh, did not awaken much interest; *Wild Wales* is lacking in the romantic flights which characterise the earlier work; and *Romano Lavo Lil*, a glossary of gipsy words and phrases, is curious, but not inspired. It is noteworthy in this connection that B. was never a scientific philologist, although he was a great linguist. Of all writers who have enjoyed popularity, he seems to be the most detached from his times, being uninfluenced, one would think, by any of the great movements he lived through, from Waterloo to Sedan. Yet it has well been said of him that no prose writer of the century can make us feel so intensely the open air life in which he revels, can transcribe in good strong Eng. the warmth of the sunshine, the beauty of the meadows, the song of the birds. And everywhere he is always himself in his love of boxing and strong ale, and his hatred of conventions, class distinctions, and society restrictions. He is above all the prose poet of the open-air life.

Works: *Faustus*, 1825; *Romantic Ballads*, 1826; *Targum*, 1835; *The Talisman* (from Russia), 1835; New Testament, 1837; *The Bible in Spain*, 3 vols., 1843; *The Zincali (Gipsies in Spain)*, 1841; *Lavengro*, 3 vols., 1851; *The Romany Rye*, 2 vols., 1857; *The Sleeping Bard*, 1860; *Wild Wales*, 3 vols., 1862; *Romano Lavo Lil*, 1874; *The Turkish Jester*, 1884; *Death of Baldor*, 1889. *See* Lives by Knapp, Herbert Jenkins, and Edward Thomas.

Borrowdale, a beautiful valley of W. Cumberland, ascending from the head of Derwentwater towards Honister Pass. It formerly possessed rich plumbago mines, which were exhausted in 1850.

Borrowing, *see* LOAN.

Borrowing Days, or **Borrowed Days**, are the last three days of March, popularly supposed, according to Scottish legend, to have been borrowed from April. The deed is thus told in quaint verse:

> 'March borrowit from Averill
> Three days and they were ill,'

and in the equally quaint prose of the *Compl*[illegible] borial of Ma: flureisc the feildis.'

Borrowstounness, or **Bo'ness**, is a seaport of Linlithgowshire, Scotland, situated on the Firth of Forth, 23 m. W.N.W. of Edinburgh. It is a somewhat dirty town in appearance, and has no notable public buildings save a fine parish church. It has a wet dock of 7½ ac., and a considerable shipping trade; shipbuilding is also carried on, whilst the other manufs. include salt refining, soap making, brewing, etc. Coal mines are worked, and some iron is smelted. Antoninus' Wall, known as Graham's Dyke, traverses the parish. Pop. 11,000.

Borsa, a tn. of Hungary, Austria-Hungary, in the dist. of Marmaros. It is noted for its mineral springs. Pop. 5500.

Borsad, a fortified tn. in the dist. of Kaira, Bombay, British India, 23 m. N.E. of Cambay. Pop. 12,228.

Borsig, Johann Karl Friedrich August (1804-53), a German manufacturer, was the founder of the engineering firm of B. He commenced business in Berlin in 1837, and as his trade advanced he was able in 1847 to begin building an extensive foundry at Moabit, near Berlin. He handed on his business to his son Albert, who still further enlarged it by erecting fresh plant and purchasing coal mines. See *August Borsig* (1880), written by Vogt.

Borsippa, or **Birs Nimroud**, *see* BABYLONIA.

Borsna, a tn. in S. Western Russia in the gov. of Chernigov. It is about 9 m. from the Pliski station, and 15 from the junction of the Desna with the Seim.

Borsod, a comitat (co.) in Hungary, stretching N. from the Theiss. It is crossed by 48° N. The cap. is Miskolcz.

Borstal System, founded on the

It had long been recognised that juvenile offenders, too old for reformatory schools, required some special treatment to save them from growing into habitual criminals, and in 1902 the plan was inaugurated which is called the B. S., from Borstal Prison, Kent, where it was first tried. Youths from sixteen to twenty-one, when sent there, were divided into three classes, penal, ordinary, and special; promotion to the higher ranks and privileges being earned by industry and good conduct. The *labour* set (*gardening, useful crafts*, etc.) was calculated to teach self-reliance and self-respect, and to be a training for after-life. Education and physical development were carefully organised, and games allowed a privilege in the evenings. In addition, a philanthropic body, the Borstal Association, assisted by the treasury, undertook to help in finding work after leaving prison. The results were very beneficial, and 'Borstal Committees' are now estab. in all prisons. As short sentences do not give time for producing the effects aimed at, the Prevention of Crime

Act was passed in 1908 to enable a sufficient period of detention under Borstal rules for those thought to be in danger of relapsing into crime. Release under supervision, and transfer to ordinary prison discipline if incorrigible, have also been instituted.

Borszek, a Hungarian vil., in the co. of Csik, 95 m. E. by N. of Klausenburg. Situated in the Carpathian valley, at a height of 2400 ft. above the sea, it is celebrated for its mineral waters, and is the most frequented watering-place in Transylvania.

Bort, a tn. in the dept. of Corrèze, arron. Ussel, France. It is situated on the Dordogne, 39 m. S.W. of Clermont-Ferrand. Pop. 4000.

Borthwick Castle, a ruined tower 13¼ m. S.S.E. of Edinburgh. Founded in 1430. It is about 120 ft. high, and measures 74 ft. by 70 ft. In June 1567, Queen Mary and Bothwell passed four days here. The historian Robertson was *b.* at the manse close by.

Borthwick, David (*d.* in 1581), was Lord Advocate of Scotland in the reign of James VI. He received his education at St. Leonard's College, St. Andrews. In 1549 he was called to the bar. He acted as lawyer to Bothwell. In 1573 he became king's advocate, and the year following he helped in forming a constitution for the Scottish Church.

Borwick, Leonard (*b.* 1868), an eminent Eng. pianist, was born at Walthamstow in Essex. After studying at Frankfort, and receiving lessons from Schumann, Iwan Knorr, and Bernard Scholz, he made his début in Frankfort when twenty-one years of age, and has since then been one of the leading English pianists.

Bory de Saint Vincent, Jean Baptiste George (1780-1846), Fr. naturalist, was born at Agen. At the age of nineteen he went to the Mauritius and made a survey of several neighbouring islands. On his return to France he served for a time in the army, and was on the staff successively of Marshals Davoust, Ney, and Soult. He subsequently conducted scientific expeditions to Greece and some of the adjacent islands, during which he devoted himself to botanical researches. In 1839 he went to Algiers. Among his works are: *Voyage dans les Quatres Principales des Mers d'Afrique*, *Expédition Scientifique de Morée*, *L'homme*, *Essai Zoologique sur le Genre Humain*.

Boryslaw, a tn. of Galicia, Austria-Hungary, 6 m. S.W. of Drohobycz; it has petroleum and ozocerite springs, which are the richest in Galicia. Pop. 12,000 of which the majority are Jews.

Borysthenes, the ancient name for the Dnieper River (*q.v.*).

Borzhom a Russian watering-place in the gov. of Tiflis, 93 m. to the W. of that city. It has a fine climate, and two hot springs: its mineral waters are exported. Pop. 6500.

Borzoi, or Russian Wolfhound, is a beautiful dog of the greyhound type, which is found to endure cold and travel rapidly over snow. It is light and slender of build, has warm, silky hair and large hairy feet; its swiftness is remarkable, and it is therefore much used in wolf-hunting. The Czars of Russia have for a long time kept special kennels of these hounds, and the first pair seen in England was given to King Edward by the Czar in 1870. Bs. hunt in couples, catching the wolf up very speedily, when one attacks it on each side, holding it until the huntsman rides up to dispatch it. When not engaged in hunting, the hound is good-tempered, obedient, and very intelligent. In colour it is usually white, but black, tan, and yellow patches are frequently to be seen. In appearance it is graceful, with a long, narrow skull, long and powerful neck and body, slender legs, deep chest, flat sides, and a profuse and silky coat. The average height of the male is 28 to 33 in., and of the female 26 to 30 in.

Bos, the technical name of a genus of the Bovidæ, or antelope, sheep, goat, and oxen family, which contains a single species but many varieties. *B. primigenius*, the wild ox of Europe, now extinct, is said to be the progenitor of the Chillingham cattle. *B. frontalis* is the gayal, *B. gaurus* the gaur, *B. sondaicus* the banteng, *B. taurus* the wild cattle or aurochs, *B. bonasus* the European bison, *B. grunniens* the yak. *See* Ox.

Bos (fossil), the oxen family, occurs in a fossil state in the superficial deposits of Europe and America. *B. primigenius* is found in the Pleistocene in Essex and Wiltshire; *B. longifrons* in Ireland is a smaller species. *Urus priscus*, a variety of B., has been found in fresh-water deposits of Yorkshire, Essex, and Worcestershire.

Bos, Lambert (1670-1717), Dutch scholar and critic, born at Workum in Friesland, and educated at the university of Franeker, where he became Gk. professor in 1704 and spent the rest of his life. His works include notes on Thomas Magister, 1698; *Exercitationes Philologicæ*, 1700; *Ellipses Græcæ*, 1702, translated into Eng. by John Seager in 1830; *Vetus Testamentum ex Versione LXX. Interpretum*, 1709; *Antiquates Græcæ*, 1714; *Animadversiones ad Scriptores quosdam Græcos*, 1715; and small treatises on accents and Greek syntax.

Bosa, a tn. of Sardinia, Italy, 30 m.

S. by W. of Sessari. The seat of a bishop; also noted for its coral fishery. Pop. 6000.

Bosboom, Anna Louisa Gertruida Toussaint (1812-86), Dutch writer, born at Alkmaar, was the daughter of Toussaint, a chemist, and the descendant of a Fr. Protestant family. During her early life she spent sev. years in historical research, of which she made good use later for her novels. In 1851 she married Jan B., the painter. Her works, many of them stories of Dutch history, are true representations of the manners and customs of the people. Among these works are: *Amalgro*, 1837; *Engelschen te Rome*, 1839; *Het Huis Lauernesse*, 1852 (trans. into sev. languages); the three stories of the Leicester family: *Der Graaf van Leycester in Nederland*, 1845; *Der Vrou van het Leycestersche tijdvak*, 1849; and *Gideon Florensz*, 1854; and *Major Frans*, 1875. See *Onze hédendaagsche letterkundigen met byschrift van Dr. Jan ten Brink*, 1882-7.

Boscan-Almogaver, Juan (*c.* 1495-1540), Spanish poet, born at Barcelona, of an ancient noble family. He came to Granada to court of Charles V. in 1516. He was afterwards entrusted with the education of the celebrated Duke of Alva. He passed some years in military service. His poems were published by his widow at Barcelona in 1543. They are divided into four books. The first contains light poems in the old Castilian metres. The second and third books consist of a number of poems in It. metre, sonnets, canzones, and poems in blank verse. *Hero and Leander* is the longest of these. The fourth book contains his best effort, *The Allegory*. He pub. in 1534 a translation of Balthasar Castiglione's It. poem, *The Courtier*. He died at Perpignan.

Boscawen, Edward (*1711-51*), admiral, third son of Hugh, first Viscount Falmouth. He became a lieutenant in 1732, served at Porto Bello, 17[illegible] commanded a [illegible] 1746; w[illegible] appointed commander-in-chief by land and sea in E. Indies in 1747. Unsuccessfully attempted to reduce Pondicherry. He was nominally M.P. for Truro after 1741. He was Lord Commissioner of the Admiralty, 1751-61; vice-admiral, 1755. He commanded on N. American Station, in Channel, off Brest, and in the Bay of Biscay at intervals between 1755-7; commander-in-chief of fleet at siege of Louisburg, 1758; Privy Councillor 1759. Defeated Fr. in Lagos Bay, 1759. He was commander of the fleet in Quiberon Bay in 1780.

Bosch, Johannes van Den, Count (*1780-1844*), a Dutch general and administrator, born in Gelderland. He took up the military profession, going to Java in 1797, and rising to be governor-general of the Dutch E. Indies in 1828. He endeavoured to improve the condition of agriculture and land tenure by introducing the so-called 'culture' system. By this system the native cultivators were exempt from ground tax, but cultivated one-fifth of the land as the gov. directed, the latter taking the produce. The results of this system were good under General B., but many disputes occurred afterwards. He was in 1818 the first head of the Society of Charity formed to attempt to give a fillip to agriculture by the cultivation of the unreclaimed heath lands in the Eastern provinces of Drente, Holland. From 1833 to 1839 he was Colonial Secretary of State, and was created count in 1842.

Boscobel, a parish in Shropshire, Newport div., 22 m. E. by S. of Shrewsbury. The manor-house here was the retreat of Charles II. after battle of Worcester, 1651. Pop. 259.

Bosco Reale, a com. in Italy, 12 m. E.S.E. of Naples at the southern base of Mt. Vesuvius. Adjoining it is the com. of Bosco Trecase. Pop. of Bosco Reale, 8400.

Boscovich, Roger Joseph, celebrated mathematician and astronomer, born at Ragusa in 1711, and entered the order of Jesuits. He was appointed teacher of mathematics and philosophy in the Collegium Romanum at Rome. His reputation was previously made by the solution of the problem to find the sun's equator and fix the time of its rotation by observing the spots. He was sent to London in 1760 to defend the interests of Ragusa. In 1764 he was appointed to a professorship in Pavia, and subsequently at Milan. After the dissolution of his order in 1773 he went to Paris, was given a pension by the king, and appointed director of optics to the navy. Afterwards returned to Milan where he gradually became insane. Died in 1787. He wrote a work on optics and astronomy, *Opera Pertinentia ad Opticam et Astronomiam*. He was also a poet.

Boscowitz, in Moravia, Austria, 21 m. N. by E. of Brünn. Has coal mines and glass and chemical works. Pop. 5000.

Boshof, a tn. of the Orange Free State, situated 40 m. N.E. by E. of Kimberley, and is the cap. of B. div. In April 1900 Lord Methuen defeated the Boers here.

Bosio, François Joseph (1769-1845), an eminent sculptor, born at Monaco. Though an Italian by birth, he was

brought up and constantly lived in France. He became a favourite with Napoleon I. He became famous chiefly on account of the figures he executed for the column in the Place Vendôme. He was also a favourite with Louis XVIII. and the succeeding kings of France, who employed him in many public works. He was created baron by Charles X., and admitted into the Institution in 1840.

Bosjesmans, *see* BUSHMEN.

Bosna River, a trib. of the R. Save, on its S. side, with a length of about 160 m. It crosses the eastern part of the prov. of Bosnia, taking a northerly course.

Bosna-Serai, cap. of Bosnia, on the Miljacka, a trib. of the B. Seat of a Rom. Catholic bishop. Manufs. iron, copper, and brass wares. A citadel overlooks the town.

Bosnia and Herzegovina, provs. until 1908 included in the European possessions of Turkey, but annexed in that year by Austria, so that at the present time they form the most southerly of the ters. of the Austrian empire. Since the treaty of Berlin, 1878, they have been administered by Austria, and so the change in 1908 was merely a nominal one. In area they are about half of the area of England, and are enclosed by Dalmatia, Servia, Albania, and Montenegro. The greater part of the country is included in the basin of the Danube. It is almost entirely mountainous, the Dinaric Alps being the chief range of mts. The chief rivs. are the Save in B. and the Warenta in H. In B. the forests on the slopes of the Dinaric Alps give a good supply of timber, and the pasturage here is also very good. Wheat, barley, and maize are also raised in sufficient quantities for home consumption, while tobacco and the vine are cultivated in the southernmost parts. Fruit is also grown to a very great extent, and the chief fruit export is prunes. There is a considerable trade between Turkey and these states, and the means of communication have been reformed very greatly during the occupation of the provs. by Austria. Railways have been built in conjunction with the railways of Hungary, and the postal and telegraphic systems have been developed by the state. The pop. is increasing, and has now reached over 1,500,000. The inhabitants are officially referred to as Bosniaks, but divide themselves up under the following divs.: Croats (Rom. Catholics), Serbs (Orthodox Church), and Turks (Moslems). Education is by no means developed sufficiently, but gradually the system is being reformed under the Austrian government.

History.—The early history of these two provinces is the history of the prov. of Illyria. Gradually, however, after the Slavonic immigrations, external pressure, especially from Hungary, caused them to unite under one ruler. But the history of the race up to well into the mediæval period can be regarded as the history of a race dependent upon the Byzantine Empire or upon Hungary. Finally, in the 13th century, it fell altogether under the sway of Hungary, and became to all intents and purposes Hungarian ter. In the 14th century it became an independent kingdom, but was finally captured in the 15th century by the Turks. From the 15th to the 19th centuries the history of the Bosnians is the history of a conquered race, crushed and spurned beneath the foot of the conqueror. The Moslems in the country quickly seized all the power, and the Christian pop. was left very much to the mercy of the Mohammedans. In 1875 a Christian rising took place, and the Christians were joined in the following year by the Servians and [illegible] finally, in 1877, on Turkey. By of 1878, the two provs. were handed over to the military occupation of Austria, and the occupation was only carried out with the utmost difficulty. But under the Austrian administrator Kállay great improvement was made in the position of the people of B. The provs. when he died in 1903 were certainly in a more prosperous and promising state than they had been since their first occupation by the Turks 400 years previous. The Young Turk movement in 1908 warned Austria that reform in Turkey might lead to such a strengthening of her power that she would be able to demand that the provs. should be evacuated. In this way the reforms and the progress made under Austrian administration would accrue only to the benefit of the Turks. Hence, taking advantage of the enweakened state of Russia, and the pending declaration of the independence of Bulgaria, Austria declared the annexation of B. and H. on October 8, 1908.

Bosos-Jeno, a town in Austria-Hungary, situated on the R. Maros. It is noted for its wines. Pop. 6000.

Bosphorus, or Bosporus: 1. Name given by ancients to the strait which leads from the Black Sea to the Sea of Azov. Called also Straits of Yenikale or Kertch. History of the kingdom is involved in obscurity. It was named Cimmerian from the Cimmeri who dwelt on its borders *c.* 750 B.C. 2. The word is derived from the Gk. denoting Ox-ford. The legend is that Io, daughter of Inachus, crossed the Thracian B. in the form of a cow.

This strait unites the Black Sea with the Sea of Marmora, and forms part of the boundary between Europe and Asia. The channel is 18 m. long, and has a depth varying from 20-66 fathoms. Its minimum width is 2¾ m. It is rarely frozen over. The inlet, on either side of which lies Constantinople, is called the Golden Horn. The shores, which are elevated, are composed of various volcanic rocks, such as dolerite and granite, but along the remaining course the formations are Devonian. The scenery on both sides is varied and beautiful, being dotted with cypresses, laurels, and plane-trees and covered with palaces, vils., [illegible]

nople. The B. is under Turkish control, and by a treaty of 1841, ratified by the treaty of Berlin in 1878 and other times, no ship of war other than Turkish may pass through the strait without the consent of the Turkish authorities (the Porte). It is an interesting historical fact that Darius Hystaspes threw a bridge over this strait when about to invade Greece in 493 B.C.

Bosquet, Pierre François Joseph (1810-61), a Fr. marshal, was born at Mont de Marsan in Landes. He entered the army in 1833, and went to Algeria a year later. Became a captain in 1839, lieutenant-colonel in 1845, and colonel of a Fr. line regiment in 1847. He returned to France in 1853. In the Crimean war he contributed greatly to the victories of Alma and Inkerman. He was wounded at the siege of Malakov, where he took a leading part in the assault. He became a marshal of the Fr. and a senator in 1856.

Bosruck is the name of an Alpine tunnel on the Pyhrn railway, connecting Klaus Steyerling with Selzthal. It belongs to Austria; is situated at an elevation of 2405 ft. above the sea. The tunnel which is 3 m. in length, took three years to build, being started in 1902 and finished in 1905.

Boss (O.Eng. *bocc*, O.H.Ger. *bozo*, tuft or branch) is an ornament in architecture which was originally placed to hide the joinings of ribs on ceilings. This ornament was afterwards [illegible] decoration on mouldings an[illegible]ure of the [illegible] the B. should have a convex section. It was first hemispherical in shape carved with foliage; after that the shape altered somewhat, and it was not necessarily round, figures and animals being introduced with or without the foliage. Eventually the general plan of the B. was square.

Bossiney, or Trevanna, a tn. of Cornwall. It sent two members to parliament before the Reform Act, 1832, transferred its representation to the county. The pop. is about 880.

Bossu, Réné de (1631-80), Fr. critic, born in Paris; studied at Nanterre; became a canon regular of Sainte-Geneviève in 1649. His chief works were, *Parallèle des principes de la physique d'Aristotle et de celle de René Descartes*, 1674; and *Traité du Poème Epique*, 1675. This latter, the theory of which was that the subject should be chosen before the characters, and the action arranged independently of them, was praised by Boileau, and twice translated into Eng. It was known to Dryden, Addison, and Pope.

Bossuet, Jacques Bénigne, celebrated orator and prelate, was born at Dijon, France, on Sept. 27, 1627. Although of bourgeois rank, his family took an honourable part in the public and official life of Burgundy. He was destined from infancy for the Church. On his father's appointment to the presidency of the parliament in Metz, Jacques was left to the care of his uncle, whose delight it was to foster his nephew's gifts. At the Jesuits' College where he was educated, he outclassed all other scholars in Gk. and Lat.—Virgil and Homer being his favourite studies. After reading the prophesies of Isaiah he was so struck by the beauty of their poetry that he became virtually 'a man of one book.' The Jesuits endeavoured to enlist him into their order, but his family was against the proposal and he went to Paris in 1642. He entered the college of Navarre where he achieved distinction in every dept. except mathematics. At the age of sixteen his attainments were the talk of the tn. At the age of twenty-four he was appointed archdeacon of Metz, and became a priest in 1652. He spent six years in pastoral activity and in study of the Scripture. He wrote at this time a book entitled *Réfutation du Catéchisme de Paul Ferry*. He became renowned as a preacher, and was in perpetual request in the city. When he appeared crowds flocked to listen. The Queen, Condé, Turenne, and Sevigne listened to him frequently, and Louis XIV. on hearing him for the first time sent a message of congratulation to the young man's father. His excellent and incomparable discourses have been divided into three parts, according to the place where they were uttered: (1) Those of Metz, showing a considerable amount of crudeness; (2) those of Paris, distinguished by strength and splendour; and (3) those of Meaux, in which faultless grace of composition is the chief

characteristic. In 1669 B. was appointed to the diocese of Condom, and later became preceptor to the Dauphin. He resigned the former post and plunged with great vigour into his new duties, recognising that on the culture of the Dauphin might depend the future welfare of the Fr. people. During this period he wrote *L'histoire abregée de la France*, *La politique sacrée*, and the celebrated *Discours sur l'histoire universelle*. In 1671 he was elected a member of the Fr. Academy. About this time he pub. the much criticised and widely-translated *L'exposition de la doctrine Catholique*. This book created much discussion, and twice received the imprimatur of the pope. In 1681 he was appointed to the bishopric of Meaux. Soon after he attended the famous assembly of the Fr. clergy, convoked by royal edict, and he preached the opening sermon. In 1688 appeared *L'histoire des variations des Eglises*, a review in fifteen books of confessions of faith emitted by Protestant churches during the Reformation period. He died at Paris in 1704. He was of unrivalled eloquence and great learning, a defender of the faith, and champion of anct. rights and liberties of the Gallican Church.

Bossut, Charles (1730-1814), mathematician, born at Tarturas, near Lyons, France, on Aug. 11. Studied under Cairant and D'Alembert. From 1752-89 professor at Mezières. After the Revolution he was professor at the Polytechnic schools in Paris, where he died. Wrote *Essai sur l'histoire générale des Mathématiques*.

Bostan, El, 'the Garden,' a tn. of Asiatic Turkey, 40 m. N.W. of Marash, on the N. side of Mt. Taurus. Pop. 8000.

Bostanjis were established by Mohammed II. in Turkey as a military force. They numbered about 5000, exclusive of local detachments, and were employed in guarding the forest districts.

Boston (Lincolnshire), municipal and parl. bor. and a seaport tn., is situated on the R. Witham, 30 m. S.E. of Lincoln by rail, on the Great Northern Railway. It lies in a flat agric. dist. Its anct. name was St. Botolph's Tn., from St. Botolph, who founded a monastery here in 654, which was afterwards destroyed by the Danes in 870. The Church of St. Botolph is a Gothic structure with a tower 200 ft. high. The docks, which have proved very profitable, belong to the corporation. B. is the headquarters of the deep-sea fishery. As a port B. was of anct. importance, but in the 18th century the riv. silted up, and thus it was only navigable for light vessels. In 1882 a dock about 7 ac. in extent was constructed. The bed of the riv. was also considerably deepened. During the 14th and 15th centuries the Hanseatic and Flemish merchants were largely responsible for its prosperity. There is a market for cattle and sheep. Foxe, the martyrologist (1517-87), was a native. The borough returns one member to parliament. Area 2727 ac. Pop. 15,667.

Boston, cap. of Massachusetts, in Suffolk co., U.S.A., is situated on an inlet of Massachusetts Bay called B. Harbour, 234 m. N.E. of New York by rail. B. has the longest railway station in the U.S., opened in 1898. A whole series of lines of railway converge at this city extending over 2000 m. At the outskirts of the city is the junction railroad connecting most of these lines with one another. The chief imports are wool and woollen goods, sugar, leather and leather goods, cotton and cotton manufs. The chief articles of export are wool, iron, and steel manufs., cotton and leather manufs., animals and bread stuffs B. is the prin. wool market of the U.S. and second only to New York in value of its foreign trade. The climate is generally healthy though exposed to E. winds, and lung complaints are very prevalent. B. is one of the finest cities of the U.S., and contains some of the choicest examples of architecture. Trinity Church, erected at a cost of 800,000 dollars, and the Rom. Catholic Church are two of the chief glories of the city. The former was begun in 1877, and built in the Romanesque style of Southern France is the masterpiece of H. H. Richardson. There are windows by William Morris, Burne-Jones, and others in it. The Mother Church of the Christian-Scientists (whose headquarters are at B.) cost £400,000 and was opened in 1906. The library (1885-1905) cost 2,486,000 dollars, is a dignified building of pinkish-grey stone, and is built in the style of the It. Renaissance. The old museum is a zed-brick edifice in modern Gothic style. An extensive system of railways, opened in 1901, and a subway relieve the traffic of the streets. This subway for electric trams is about 3 m. long, in part with four tracks and in part with two. It was built by the city at a cost of about 7,500,000 dollars (£1,500,000), but was leased and operated by a private company on such terms as to repay its cost in forty years. Among other public buildings are Tremont Temple, headquarters of the New England Baptists, Free Public Library, post office and sub-treasury buildings, Lowell Institute, hospitals, scholastic

institutions, etc. It has a university, a medical college, and two conservatories of music. As a musical centre it rivals New York, and was the undisputed literary centre of America until the latter part of the 19th century. It bore a conspicuous part in the early trouble with England, and brought about the B. Massacre of 1770. After the destruction of the British-taxed tea in the harbour (1773), the port was closed and the tn. was occupied by a British force, which was compelled to evacuate in March 1776. During years 1830-60 it was the headquarters of the movement for the suppression of slavery. The city has suffered much by conflagration, especially in 1872, when 80 acres of buildings were destroyed by fire. Bp. of Franklin, Copley the painter, Poe, Emerson, and many other eminent men. Pop. 560,892.

Boston, Thomas (1677-1732), Scottish divine, employed in the office of Alex. Cockburn, writer to the signet, in 1689. M.A. Edinburgh 1694. He studied theology during years 1690-1701. He was minister at Ettrick, 1707-32. Basing his views on a work, *Marrow of Modern Divinity*, he, with eleven others, opposed an Act of Assembly in 1720, condemning the book. These twelve were nicknamed 'the twelve apostles' and 'marrow men.' He pub. chiefly religious works. A treatise on Heb. accents also appeared posthumously.

Boston Tea Party, so called from a [illegible] which [illegible] 1773. [illegible] was [illegible] into the States which had just been attempted. There was also a large protest meeting at the Old South Church, and as this proved a failure, on the same night about fifty men who were disguised as Mohawks boarded the British tea ships in the harbour, and cast overboard 400 chests of tea.

Bostrichus, a genus of coleopterous insects of the family Bostrichidæ. The beetles of this family are found on old trees, upon which the larvæ feed, and they greatly damage woods. *B. capucinus*, rarely found in Britain, is about half-an-inch long, has black legs, head, thorax, and antennæ, and the rest of the body is red.

Boström, Erik Gustaf (*b.* 1842), a Swedish politician, was a member of the Second House of the Swedish Parliament from 1875 to 1893. He was Prime Minister from 1891 to 1900, and for a second time in 1902. In politics he belongs to the Conservative party, and is in favour of protection; he is now a member of the First House of Parliament.

Boström, Kristoffer Jakob (1799-1866), a Swedish philosopher, studied at Upsala University, and was tutor to the Swedish princes from 1833 to 1837. In 1840 he was made professor of practical philosophy at Upsala, a post he held till 1863. The principle of his philosophy, which may be termed a rational idealism, is that the only true reality is the spiritual in nature, and the highest aim is the direction of action by reason in harmony with the Divine will. The difference of his system from Platonism constitutes also a resemblance to Spinozism—that the 'ideas' of God are not mere abstractions, but living personalities.

Boswell, Alexander (1775-1822), son of James B., the companion and biographer of Dr. Johnson, was born at Auchinleck. He was educated at Westminster and Oxford. He settled at Auchinleck, where he set up a private press and printed many rare books in early English and Scottish literature. He inherited his father's love of industry and of letters, and published many volumes of verse. In 1817 he contributed twelve songs to Thomson's select collection of original Scottish airs. He was created a baronet in 1821 for a loyal composition entitled *Long live George the Fourth*. He fought a duel with James Stuart of Duncarn in 1822, who challenged him as the author of certain truculent pasquinades reflecting on his honour and courage. B. was mortally wounded and died the next day. He was a devoted admirer of Burns, and by his own exertions raised £2000 for the monument on the banks of the Doon.

Boswell, James (1740-95), biographer of Johnson, and son of Alex. B., Lord Auchinleck. He was educated at Edinburgh High School and University, studied law at Glasgow under Adam Smith and also at Edinburgh. He made the acquaintance of Johnson in London in 1763. Studied civil law at Utrecht in 1765, and travelled thence to Berlin and Geneva, meeting V[illegible] made the [illegible] Italy, and Paoli in Corsica. He returned to England in 1766, became an advocate in the same year. He pub. an *Account of Corsica* in 1768, and *Essays in favour of the Brave Corsicans* in 1769. He made frequent visits to Johnson in London between the year 1772-1784; toured with Johnson in the Hebrides, Aug to Nov. 1773. In the same year he was elected a member of the Literary Club. He then began to keep terms at the Inner Temple in 1775, and succeeded to his father's estate 1775. He pub. a *Letter to the*

People of Scotland on the present state of the Nation, hoping to gain thereby political influence (1783). He pub. a journal of his tour to the Hebrides, the work being revised by Malone in 1786. He was called to the Eng. bar in 1786; recorder of Carlisle, 1788-90; came to reside in London, 1789; and pub. the *Life of Johnson* in 1791. He became secretary of foreign correspondence in 1791.

Boswell, James (1778-1822), son of Johnson's biographer, a barrister by profession and a member of the famous Roxburghe Club, was awarded the Vinerian fellowship at Brasenose, Oxford. He completed his friend Malone's *Shakespeare* (2nd ed.), and also edited the third variorum Shakespeare, 1821.

Boswellia, a genus of balsamic plants belonging to the order Burseraceæ, comprising ten Indian and African species. They are said to yield olibanum or frankincense used in incense in Catholic churches, and one species is supposed to be the *Libanos* of Theophrastus, the *Thurea virga* of the Romans. *B. thurifera*, a large Indian timber-tree, and *B. glabia*, also Indian, yield a resin.

Bosworth (Leicestershire), a small market town 12 m. W. by S. from Leicester. Two miles to the S. is B. Field, the site of the last battle between the houses of York and Lancaster, Aug. 22. 1485, when Richard III. was beaten by the Earl of Richmond, afterwards Henry VII., and slain. Dr. Johnson was an usher in the Grammar School. Pop. of parish 855.

Bosworth, Joseph (1788-1867), professor of A.-S. in the university of Oxford, was born in Derbyshire. Educated at Repton Grammar School and Aberdeen University, where he took the degrees of M.A. and LL.D. In 1815 he took a curacy at Nottingham, and two years later was presented to the vicarage of Harwood Parva in Bucks, where he remained twelve years. He next spent several years in Holland. He devoted much time to literature and especially to researches in A.-S. His literary reputation rests on his *Grammar and Dictionary of Anglo-Saxon*. His *Elements of Anglo-Saxon* appeared in 1823. His prin. and most useful work, a *Dictionary of Anglo-Saxon Language*, was pub. in 1838. He was a Fellow of the Royal Society and of the Society of Antiquaries. In 1840 he obtained the vicarage of Waithe, Lincs.; in 1857 the rectorship of Water Stratford, Bucks., and in 1858 the professorship of A.-S. at Oxford University. He held the chair until his death.

Böszörmeny, or Hajdu-Boszormeny, a tn. with a magistracy in the prov. of Hajduken, Hungary. It is situated 13 m. N.N.E. of Debreczin. Pop. 21,200.

Botallack is the name of a mine on the W. coast of Cornwall, 7 m. W. of Penzance. From 1721 it was worked for tin, and in 1841 for copper. The works are at the cliff's edge, and extend over 2000 ft. below the sea. Visitors are attracted by the beautiful scenery.

Botanic Garden. The B. G. has for its primary object the promotion of botanical science, and is of comparatively modern origin. It owes its birth to pharmacy. The earliest European school of medicine was at Salerno, and there we find records of the medical garden of Mattheus Sylvaticus (1309). In 1333 a similar garden was estab. by the republic of Venice. Soon many public and private bodies followed the example. The botanical garden, in the modern use of the phrase, dates from a private one erected at Padua between the years 1525-33, from the public one at Pisa, estab. by Cosmo de Medici in 1544, or from that of Padua in 1555. B. Gs. were then laid in most It. cities and at the universities of Leyden, Leipzig, Breslau, and Heidelberg. A royal garden was estab. at Paris in 1597, its chief use being to supply the ladies of the court with bouquets, and it was not until 1616 that its scientific purposes were defined. This garden became famous as the Jardin des Plantes, and chairs of botany and pharmacology were founded in 1635. In the 17th century many gardens were laid, the chief including those at Oxford, Chelsea, and Edinburgh. In the last century, further stimulus was given to this movement by Linnæus. Most European and American universities now possess a botanical garden. In America are also the famous gardens of Philadelphia and New York. Kew Gardens in London, estab. in 1760, are generally regarded as the largest and best equipped gardens in the world, and there are also fine gardens at Berlin, Vienna, and Edinburgh. The principle of arrangement of the plants is varied, some ranging them according to their geographical distribution, and others according to their medical and economic interests. The varied origin of the plants necessitates placing them in conditions similar to those from which they were taken.

Botany (Gk. βοτάνη, plant) is the science which comprehends all that relates to the vegetable kingdom, and deals with plants in both the living and the fossil state. It treats of their external and internal morphology, or

structure and development; of their anatomy; histology, or minute internal structure; physiology, or their functions and organs; eclology, or relation to their environment; pathology, or diseases; phylogeny, or descent from other forms; paleobotany, or fossil forms; geographical distribution; taxonomy, or classification and economic uses. In itself it constitutes a large division of Biology, or the science of life, and is thus associated with Zoology, which deals with animal life. B. is an ancient branch of learning, dating from the time of Solomon, who 'spake of trees, from the cedar of Lebanon to the hyssop on the wall' (1 Kings iv. 33). Herodotus and Aristotle were conversant with the science, while Theophrastus studied the morphology of plants. Another Greek, Discorides, seems to have been the first author of a book on Materia Medica, while Pliny wrote of grafting and budding, and recognised the sexuality of flowers. In the year 1532 Otho Brunsfels, a Bernese physician, published the *Herbarum Vivæ Eicones*, in which he described about 240 species, about one-fifth of the whole number of those which had been discovered up to his day by the Greek, Roman, and Arabian herbalists. As a reformer of the science he was followed by Tragus, Fuchs, and Matthiolus, and especially by Conrad Gesner, a native of Zurich, who was assisted by compilers in making a collection of known species from various books. The followers of Gesner were ous, and among the most disti of them, between the years 1 1660, were Turner, Dodoens Clusius Cæsalpinus, and the The knowledge of so many made classification imperat Matthew Lobel, a Dutch physician, [illegible] perfect, but it comprehended several combinations which are recognised at the present day, *e.g.* plants belonging to the Leguminosæ and Gramineæ. Wm. Turner, known as the 'Father of English B.' succeeded Lobel, publishing a book on systematic arrangement in 1551, and in 1597 a barber-surgeon of Holborn, John Gerard, wrote his *Herbal*, which was the standard book of English botanists in the 17th century. A methodical arrangement of plants was discovered by Cæsalpinus, a Roman physician attached to the court of Pope Sixtus V., whose *De Plantis* appeared in 1583. Later on other discoveries were made, *e.g.* spiral vessels were described by Henshaw in 1661, while Hook excited attention by his examination of cellular tissue, and Grew gave rise to physiological B. The true principles of classification were at length obtained by *John Ray*, who expounded these in his *Historia Plantarum*, the first volume of which appeared in 1686. The science had now become so firmly established in England that a professorship of B. was created at Oxford, and the chair was filled by Dr. Robert Morison (1620-83). In France J. P. de Tournefort was elected professor at the Jardin des Plantes, and in 1700 he described his system of classification in his *Institutiones*. This was subsequently displaced by Linnæus, whose *Species Plantarum* was published in 1753, and who revolutionised the whole of this branch of B. He insisted on the importance of a good nomenclature, and examined particularly the sexual system of plants. Eleven years after the death of Linnæus, A. L. de Jussieu, in 1789, produced, under the name of *Genera Plantarum*, an arrangement of plants according to their natural relations, using as stepping-stones Ray and Tournefort. A. T. Brongniart, the French botanist, is responsible for an increase of knowledge in the fertilisation of plants, establishing the theory of Amici that pollen-tubes [illegible] To the work of classi- am and Sir Wm. fessor of B. in of Kew Garden in 1841, have contributed greatly in *Genera Planta- Imprimis in Servata De-* classification ne present time ; divided into *Thallophyta*, Bryophyta, Pteridophyta, and Spermaphyta, each of which is again divided. The Thallophyta includes the Algæ, to which all sea-weeds and many fresh-water plants belong, and the *Fungi*, to which mushrooms, toadstools, and moulds belong; the Lichens [illegible] characteristics and are also The Bryo- include liver- worts and mosses, while the Pteridophyta, or Vascular Cryptogams, comprise ferns, selaginellas, equisetum, and club mosses. The Spermaphyta, Phanerogams, or *Flowering Plants* is the largest group, and is subdivided into Gymnosperms and Angiosperms. The *gymnospermous flowering plants* are trees or shrubs which have their ovules freely exposed, the carpel is not closed to form ovary, style, or stigma, the flowers are always unisexual and the plants usually monœci-

ous; they include the Cycads, Conifers, and Gnetaceæ. The angiospermous flowering plants are numerous, and comprise many shrubs and trees as well as herbaceous plants and grasses. Among them the Monocotyledons are plants which have only one seed-leaf, and they are usually characterised by having parallel venation in their leaves, the flowers in parts of threes, *e.g.* the palms, grasses, lilies, and orchids; the Dicotyledons are plants which have two seed-leaves, and are characterised by having reticulate venation in the leaves, and the flowers in parts of twos, fours, or fives, *e.g.* buttercups, roses, parsley, nettles, bluebells, and oak. In studying the morphology of plants it is usual to begin with the simplest form of vegetable life, and this may be seen in some algæ. The lowest plant is a unicellular body composed of protoplasm, containing a single nucleus, and several chloroplasts which are coloured green by chlorophyll. In the next form the plant shows a distinction between a base and apex, one descending into the earth for fixation and to obtain nourishment, the other ascending to the light. Among the Bryophyta there is no such differentiation into root and shoot, but in the Pteridophyta both are present. In the Phanerogams, of course, a root and shoot are the essential parts of a plant, and specialisation of other members reaches a very high point. The shoot bears upon it many leaves and modifications of leaves, the most noticeable being the foliage-leaf, which consists of a *vagina*, or leaf-base; *petiole*, or stalk; and *lamina*, or blade. In many Dicotyledons, but few Monocotyledons, the vagina has two little out-growths called *stipules*, *e.g.* the rose. The embryonic leaves of a plant are known as *cotyledons*, the membranous leaves found on underground stems or serving as protection for buds are known as *scale leaves*, while the leaf-structure in the axil of which a flower appears is called a *bract*. The flowers themselves are made up entirely of leaves, and a complete, perfect dicotyledon has present a calyx, corolla, androecium and gynœcium all composed of leaves. In Monocotyledons the calyx and corolla (*i.e.* the sepals and petals) are fused together, and the result is a *perianth*. The essential organs of the flower are the androecium, or stamens, and gynœcium, or pistil, because it is they which are responsible for the reproduction of their kind. The stamens are composed of a *filament* and *anther*, in which is stored the pollen that fertilises the female organs. The pistil consists of an *ovary* containing ovules, a style, and a stigma. When in a single flower both androecium and gynœcium are present, it is said to be hermaphrodite or bisexual, *e.g.* buttercup; when the flower consists of only one of these organs, it is unisexual. If hermaphrodite, male and female flowers are all found on one plant, *e.g.* ash, it is *polygamous*; if the unisexual flowers occur on the same plant, *e.g.* hazel, they are monœcious; and if on different plants, *e.g.* willow, they are dicœcious. The internal morphology, or histology, of plants is concerned with the cell, its origin, structure, contents, etc., the tissues and tissue-systems to which it gives rise. The changes in these contents, the fusion of cells, the thickening of the cell-wall, its growth in surface-extent, and its chemical changes are a few of the subjects which must be studied in connection with histology. The physiology of plants deals with the processes they undergo for their nutrition and growth. Water is essential to all plants, and the living substance of a green plant is built up of carbon, oxygen, hydrogen, nitrogen, sulphur, and phosphorus, while such other chemical elements as calcium, potassium, magnesium, iron, sodium, silicon, and chlorine also enter into its composition. The carbon is obtained from the carbon dioxide of the atmosphere by the green parts of the plant in the presence of light by means of the process known as *photosynthesis*, or carbon assimilation. All the other elements are procured by *root-absorption*, a method by which water containing salts in solution passes into the plant through the root. It is evident that a large amount of water is absorbed, and the surplus is given off from the ærial parts as vapour by the process of *transpiration*, which, as it is regulated by the vital activity of the plant, is by no means identical with mere evaporation. *Respiration*, in plants, unlike carbon-assimilation, takes place over their whole surface, independent of light and chlorophyll; it is a breathing process as contrasted with one which feeds, and the two are opposed in that respiration absorbs oxygen and gives out carbon dioxide, while photosynthesis performs the reverse action. Growth is the result of all the various building-up and breaking-down processes which constitute metabolism. The simple cell which is the foundation of plant-life receives nourishment by carbon-assimilation and other nutritive processes, hence grows in extent, while the cell-wall grows by means of respiration, which decomposes the protoplasmic substance, sets free energy, and forms certain

necessary building-up substances. Reproduction is effected sexually and asexually; in the former case two sexual cells, or *gametes*, fuse together to produce a cell which eventually develops into a new plant; in the latter part of the parent plant, either a single reproductive cell called a spore, or a specialised vegetative part gives rise directly to a new plant. In the lower divisions of the vegetable kingdom an *alternation of generations* is often to be observed, *i.e.* a spore produces a new plant which in its turn gives rise to gametes, and the plant resulting from the fusion of gametes again produces spores. In the higher plants the sexual method is predominant; the pollen, when transferred to the stigma, sends out a pollen-tube which pierces both stigma and style, finally reaching an ovule and converting it into a seed with power of reproducing its kind. The geographical distribution of plants is the science which endeavours to discover the reasons for the presence or absence of particular plants in various parts of the globe. The first step in this science is, naturally, the arranging of the plants in their different areas, and then the consideration of their chief characteristics, their modifications, methods of life, the effect of the soil and external conditions, their relation to plants in other areas and kindred subjects. Various special articles should be consulted on these points, such as the article entitled ARCTIC EXPLORATION (*Flora*). Paleobotany, or fossil B., is a study which has engaged the attention of scientists for little over a century, though occasional reference to fossil plants have been made by early writers. Leaf impressions were first recorded by J. D. Magu in 1664, and the first book published in Britain on such a subject was that of Eduard Lhuyd, who in 1699 produced his *Lythophylacii Britannici Iconographia*. The chief work of A. F. Brongniart was his *Prodrome d'une Histoire des Végétaux Fossiles*, which appeared between the years 1828 and 1847. More modern paleobotanists are Scott, Seward, Schimper, and Dawson. *See*, for classification, G. Bentham and J. D. Hooker's *Genera Plantarum*, 1862-83; A. Engler and K. Prantl's *Die Natürlichen Planzenfamilien*, 1887; Dr. E. Warming's *Den Sytematiske Botanik*, 1891; for general morphology, etc., D. H. Scott's *Introduction to Structural Botany*, 1894; S. H. Vines' *Student's Text-book of Botany*, 1902; and Prof. E. Strasburger's *Practical Botany*, new English edition, 1912; for geographical distribution, A. H. R. Grisebach's *Die Vegetation der Erde*, 1872; O. Drude's *Handbuch der Planzengcographie*, 1890; for paleobotany, P. Schimper's *Traité de Paléontologie Végétale*, 1869-74; J. W. Dawson's *Geological History of Plants*, 1888; A. C. Seward's *Fossil Plants*, 1898; D. H. Scott's *Studies in Fossil Botany*, 1909. *See also* J. Britten and G. S. Boulger's *Biographical Index of British and Irish Botanists*, 1893.

Botany Bay (and suburb), an inlet on the W. of the co. of Cumberland, New South Wales, *Australia*. On its shore is the township of B. forming a suburb of Sydney. It was discovered by Captain Cook in 1770 who landed at a spot now marked by a monument and took possession for the crown. It received its name from John Banks, the botanist of the party, on account of the great variety of its flora. The tn. was fixed upon as a convict settlement, but the idea was abandoned and the settlement was made at Sydney instead. The first governor was Arthur Philipp, 1788. The transportation of criminals to New South Wales ceased in 1840.

Bot-fly is the name of any species of dipterous insect of the family Œstridæ. These flies are large and hairy, with very short antennæ, and their larvæ are usually to be found in mammals. *Gastrophilus equi* is the gadfly of the horse, which lays its eggs on the animal's hairs; the horse is irritated and licks them off, the larvæ remain in its stomach until ready to pupate, then pass out and become mature externally to their host. *Œstrus ovis* occurs in the nostrils of sheep; *Œ. tarandi* in the skin of the reindeer; *Hypoderma bovis* on the legs of cattle, and the larvæ often occasion *warbles* or tumours under the skin of the back.

Both, Jan (1610-52), and **Andreas** (1609-50), Dutch painters, born at Utrecht, and early went to Italy, being two of the first Dutch painters to come definitely under Italian influence. At Venice it is said that Andreas was drowned in a canal. The two worked together, Jan painting the landscapes into which Andreas painted the figures and animals. Jan deals with the scenery of the Italian lakes in the manner of Claud Lorraine. Both brothers also executed etchings.

Botha, Louis (1862-1912), Boer general and statesman, first Premier of the Union of South Africa, son of one of the Voortrekkers, was born at Greytown (Natal). He saw active service in savage warfare and served as field cornet in 1887. Soon after he settled in Vryheid district, which he represented in the Volksraad of 1897. In the war of 1899 he served under Lucas Meyer, but he soon received higher commissions. He was in com-

mand of the Boers at Colenso and Spion Kop. During these conflicts he gained such high reputation that he was made commander-in-chief of the Transvaal Boers on the deccase of General Joubert. After the fall of Pretoria he reorganised the Boer resistance with a view to continued guerilla warfare. This movement was successful in its aim, for the Boers resisted for three years. He was chief representative of his countrymen in the peace negotiations of 1902. He went to Europe with Generals De Wet and De la Rey in order to raise funds to enable the Boers to resume their former avocations. During the period of reconstruction under British rule, General Botha gave liberal advice with regard to measures which he thought would tend to the maintenance, order, and prosperity of his people in the Transvaal. After the granting of self-gov. to the Transvaal in 1907, B. was called upon by Lord Selborne to form a gov. In the next year he was present at the colonial conference in London. On this occasion he declared the wholehearted adhesion of the Transvaal to the British empire and his intention to work for the welfare of the country. Resigned on Dec. 14, 1912, on account of disaccord in his cabinet.

Bothie, originally denoted a humble cottage or hut, but later it denoted a barely furnished and generally uncomfortable dwelling for farm servants. The system prevails in the E. and north-eastern dists. of Scotland, and consists of building the outhouses (barns, stables, etc.) of a farmstead in the form of barracks in which the male servants reside. The cubic contents are generally disproportionate to the number of inmates, and the furniture is of a rude and uninviting character.

Bothnia was in former times the name of a country of N. Europe which extended along the eastern and western coasts of what was then, as it is now, the Gulf of B. The eastern portion now is included in Finland, and the western in the Swedish province of Norrland.

Bothnia, Gulf of, is the name given to that part of the Baltic Sea between 60° and 66° N. lat., and 17° and 25° 30′ E. long. To the S. are the Aland Is.; the eastern shore of the gulf is part of Finland, the western and northern, of Sweden and Lapland. The depth varies from 20 to 50 fathoms. Navigation is rendered difficult by the number of small is., sand-banks, and cliffs, or 'skaers,' but there are many good harbours. Numerous rivs. flow into the gulf from Sweden and Finland; the alluvial deposit from these has caused the land to encroach on the sea in the upper part of the gulf. The contrary has been the case in the S.W., where the sea is gradually overflowing the land. The salinity of the water is not great, and is less when the rivs. are flowing into it. In winter, however, the whole surface is generally frozen so hard that sledges can be driven over it.

Bothriocephalus is a genus of Cestoda, or tapeworms, which belong to the Platyhelminthes. The species have two weak and flat suckers, the body is segmented and the head has no hooks. *B. latus* is parasitic on man, and as its first stage occurs in fish it is found in countries where fish is not thoroughly cooked, as in Russia, Poland, Switzerland, and S. France. It may attain a length of 30 ft. *B. liguloideus* occurs in China and Japan and grows to a length of 8 in.

Bothwell, a town of Lanarkshire, Scotland, situated on the r. b. of the Clyde. It is a residential quarter for Glasgow. The riv. is crossed by a suspension bridge whi battle foug under Monmouth and the Covenanters, in which the latter were utterly defeated in 1679. In the vicinity is the splendid Norman ruin of B. Castle. There is also a priory founded in the 13th century. The manse of B. was the bp. of Joanna Baillie (1762-1851), dramatist and poetess.

Bothwell, Adam (*c.* 1527 93), Scottish divine, bishop of Orkney, 1562. On commission for revising *Book of Discipline*, 1563; lord of session, 1565. He was one of the four Scotch bishops who embraced the Reformation. He performed, after Protestant form, the marriage ceremony of Mary and Bothwell at Holyrood House, but soon afterwards deserted her party, and crowned and anointed her infant son, Charles James, at Stirling, 1567. B. was for a time suspended from the ministry by the General Assembly, 1567, for solemnising the marriage of Mary and the Earl of B. He exchanged a part of his bishopric of Orkney with Robert Stewart for the abbey of Holyrood House, about 1570. Imprisoned for a time for opposing Morton. On commission to frame a revised ecclesiastical settlement, 1572; one of the lords of articles at parliament, 1584. *See* Keith's *Catalogue of Scotch Bishops*, 1824; Burton's *History of Scotland*, iv., 1867; Mackie's *History of Holyrood House*, 1829.

Bothwell, James Hepburn, Earl of (*c.* 1536–78), was the son of the third earl, succeeded his father in 1556. In addition to the family estates and titles he succeeded also to the hereditary offices, which in-

cluded that of the lord high admiral of Scotland. He showed himself at the beginning of his career to be thoroughly anti-English and he soon joined himself to the party of Mary of Guise, although he himself was a Protestant. He had a violent quarrel with Arran, a quarrel which originated in his appropriation of a sum of money which was sent by Queen Elizabeth to the lords of the congregation. He was employed by the Scottish courts on many missions, and in 1561 was sent from Paris by Mary Queen of Scots to summon parliament. He made peace with various of his rivals, and although he had but recently been made a privy councillor he again was ordered to leave the city on the outbreak of riots between himself and his enemies. For a short time he suffered imprisonment, it being alleged that he had plotted with Arran against Mary. He broke prison, and although he again submitted to the queen, he was forced into exile owing to the predominance of the influence of Murray. In 1564 being captured on Holy Is. he suffered a short imprisonment again, this time in the Tower. He was recalled, however, to aid Mary in putting down the insurrection of Murray, and he now comes forward as the champion of Mary. Mary married to Darnley was gradually becoming more and more tired of her feeble husband. The murder of Rizzio in March 1566, marks the beginning of the complete ascendency of B., and Mary began to show a marked preference for him. He was made the most powerful noble in Scotland, and estates were showered upon him, and Mary showed her affection for him in many other ways also. She visited him at Dunbar; he was wounded, she rode forty miles to see him; and finally she was present with him when the final disposal of Darnley was arrived at, and he himself superintended all the arrangements which led to the blowing up of Kirk of Fields. B. stood his trial for the murder, but Lennox was practically forbidden to attend, and B. was declared not guilty. He now made preparations for his marriage with Mary, and although his previous marriage was declared null and void, it is doubtful whether his marriage to Mary was legal at all according to the law of the Roman Catholic Church. On May 12, he was created Duke of Orkney and Shetland, and on the 15th, Mary and he were married according to the Protestant rites. The nobility, however, quickly rallied together to effect his defeat, and he take place and B. parted from Mary, reached the Orkneys, and from there sailed to Norway. He was captured by the authorities and sent to Copenhagen. He managed to obtain the good will of the king, and all efforts to obtain his surrender were in vain. He still frequently corresponded with Mary, but as his restoration was impossible, Mary demanded a divorce, which she obtained in 1570. His later years were spent in solitary confinement which brought on insanity. He died on April 14.

Bothynoderes is a genus of coleopterous insects of the family Curculionidæ. The species are usually prettily mottled, the common colours being grey, black, and white. *B. albidus* (or *Curculio albidus*) is about half an inch long and is white, with the central part of the thorax, a facia, and four spots on the wing-cases black.

Botocudos, a barbarous tribe of S. American Indians of Eastern Brazil, inhabiting the E. Coast Range. Their name is derived from the Portuguese 'botoque,' a plug, with reference to the wooden plugs or discs worn in their lips. They are below medium height, broad-shouldered, and remarkable for the depth and muscular development of chest. Their features are broad and flat, with high cheek-bones, wide nostrils, and thick lips. They are of a light yellowish brown colour and have the general yellow tint of Mongolic races. They wander naked in woods and live chiefly on forest products. They look upon the sun and moon as the bestowers of blessings, and they are abjectly afraid of spirits. At a burial fires are made round the grave to drive away evil spirits. They live in rough shelters of leaf and bast, seldom over 4 ft. in height. Efforts have constantly been made to annihilate them, and the Portuguese regarded them more as wild beasts than as human beings.

Botosani, a tn. in Roumania, cap. of the prov. of same name, 47 m. S.E. of Czernowitz. Pop. 31,000.

Bo-Tree, or *Ficus religiosa*, is a tree of the order Moraceæ: it is allied to the Banyan (*q.v.*), and is sometimes called the Peepul tree. It has long, sharply-pointed leaves from which rain drips off very readily, and grows in damp forests. The milky latex yields caoutchouc. Vishnu is said to have been born beneath this tree.

Botrychium is the name of a genus of ferns of the order Ophioglossaceæ which grow in temperate and tropical lands, and in Britain are represented by *B. Lunaria*, the common moonwort. The stem is a subterranean rhizome, the roots are fleshy, branched,

and produce no buds, and the leaves grow so slowly that they take five years to show above ground. The sporophylls are petiolate and bear a fertile and a sterile lamina, which are usually both branched. The prothallus is a small, ovid body, with scattered root-hairs, and usually bear antheridia on the upper, archegonia on the lower, surface. The prothallus of *B. virginianum* remains fixed to the sporophyte for about five years.

Botryllus is the typical genus of tunicates of the family Botryllidæ, first observed by Gärtner and afterwards estab. by Pallas. The species are sub-marine, very small, soft, irritable, and contractile, and are found adhering to other bodies in bunches of ten or twelve arranged like rays of a star round a common centre. They are found in Europe, N. America, and the Mediterranean.

Botrytis is a minute fungus to which what is called *mildew* is often attributable. The tiny plants appear as a brownish-white patch on the object they have attacked, but under a microscope they are seen to consist of upright brown stalks, branched at the tips, each branch bearing pale-coloured spores. They attack the fibres of vegetable fabrics, such as linen and cotton, when placed in damp places, seedling pines, lilies, decayed stems of various plants, and decaying fruit.

Botta, Carlo Giuseppe (1766-1837), It. poet and historian, born in Piedmont. Studied medicine in Turin, and became a physician in the Fr. army. In 1790 he was appointed member of the provisional gov. of Piedmont. After the incorporation of Piedmont with France he went to Paris, where, as member of the 'corps législatif,' he gave offence to Napoleon. After the Restoration he became rector of academies at Nancy and Rouen. In 1830 he was allowed to return to his native tn. and received a pension. He died in Paris. His early works are on Corfu, Dalmatia, and the American Revolution; *Histoire des peuples d'Italie; Storia d'Italia dal* 1490 *al* 1814, consisting of Guicciardini's work and his own continuation of it.

Botta, Paul Emile (c. 1805-70), Fr. traveller and archæologist, son of Carlo Giuseppe B., a celebrated Italian historian. In 1826 he accompanied an expedition of discovery round the globe which lasted three years. As physician to Mehemet Ali he accompanied his expedition to Sennaar in 1830. He was subsequently appointed consul at Alexandria, consular-agent at Mosul, and in 1836 consul-general at Tripoli. In this situation he remained for twenty years. During this period he made his memorable explorations of the mounds of Kouyanjik and Khonsabad. He was promoted officer of the Legion of Honour in 1845. His greatest work was *Monuments de Ninive découvert et décrit par P. E. Botta.* He died near Poissy in April.

Bottari, Giovanni Gaetano (1689-1775), a scholarly Italian priest, born at Florence. He assisted in the publication of a new edition of the *Vocabolario della Crusca*, and was later appointed librarian at the Vatican. His writings are numerous, and include works on the catacombs at Rome, and an edition of *Virgil.*

Bottego, Vittorio (1861-97), an It. explorer, in 1892 started from Berbera and reached the Upper Juba, which he explored to its source. Between 1895 and 1897 he explored the neighbourhood of Lakes Margherita and Rudolf, and the Sobat riv. system, but in the latter year was murdered in the Abyssinian Highlands by the Somalis. For an account of his first journey see his book *Viaggi di Scoperta nell Cuore dell' Africa*, 1895; for an account of the second see *Seconda Spedizione Bottego*, 1899, by Varmutelli and Citerni.

Bottesini, Giovanni (1823-89), contrabassist, born at Crema in Lombardy on Dec. 24. He went on a concert tour in 1840 which extended to America. During this tour he established his fame as the greatest master of the double-bass fiddle. He directed the Italian opera from 1846 in Havana, Paris, Palermo, and Barcelona. He became director of the Conservatory at Parma. He composed among other works four operas and an oratoria. One of his best compositions is his *Méthode de complète de contre-basse.*

Böttger, Johann Fredrich (1682-1719), porcelain manufacturer, practised alchemy until Augustus, elector of Saxony, employed him more profitably in his pottery works. He was the first European to reproduce porcelains exactly like the Chinese. With state prisoners for workmen, he manufactured his 'red porcelain,' resembling Chinese 'boccaros' (teapots) at the fortress of Meissen. This was so dense that a lapidary could polish it like a stone.

Botticelli, Sandro, more properly Alessandro di Mariano dei Filipepi (1444-1510), a celebrated Florentine painter. He derived his name of B. apparently from his eldest brother, who was a broker in a fair way of business, and who seems to have taken charge of the boy; this brother was nicknamed Botticello. He seems to have been physically weak, and was probably at an early age apprenticed,

since his father was too poor to permit him to remain at home and do nothing. He would seem to have spent his early apprenticeship with his brother Antonio, who was a goldsmith, but having shown a great aptitude for painting he was apprenticed to the famous Fra Filippo Lippi. For eight years he remained under the guidance of this master, and was probably employed in helping to complete the frescoes which Lippi had been commissioned to do at Prato. In 1467 Lippi left Florence for Spoleto, and B. was left to do his work without the influence of the master. At this period he seems to have come under totally fresh influences, from which he learnt much that he would probably never have learned from Lippi. In 1470 appeared one of his great pictures, 'Fortitude,' which is at present in the Uffizi. The realistic influence of this period of his life is also obvious in the paintings of 'Judith and Holofernes,' and 'St. Sebastian.' During this period he had also come into contact with a number of the painting schools of Florence, and had contracted the friendship of Leonardo da Vinci. A number of the Madonnas which are ascribed from this period to Sandro have been proved not to be by this artist at all, but by imitators of him. Sandro came also under the patronage of Lorenzo the Magnificent, and executed several works for him, in addition to incorporating many portraits of the Medici family in some of his most famous pictures. His great patron, however, was another Lorenzo de' Medici, who was related to the family of Lorenzo the Magnificent. For this patron B. painted his famous 'Primavera' about the year 1478. He painted sev.

artists in the decoration of the chapel of Sixtus IV. at the Vatican, an[illegible] was probably responsible for [illegible] papal portraits which decorate [illegible] chapel. Of his celebrated frescoes of this period may be mentioned 'The History of the Life of Moses,' 'The Destruction of Korah, Dathan, and Abiram,' and 'The Temptation of Christ by Satan.' This period may be taken as the greatest in the life-work of the painter, and it is probably to this period that we owe the production of another 'Adoration of the Magi.' From Rome he returned to Florence, where he continued his labours for the next ten years. Amongst the works which he produced at this time are: 'The Magnificat,' 'Abundance,' 'Birth of Venus,' 'Pallas and the Centaur,' 'The Annunciation,' and 'The Last Communion of St. Jerome.' The death of Lorenzo the Magnificent led to considerable political disturbances in Florence, but Sandro seems to have still continued his labours with his own patron Lorenzo, and to have executed a number of drawings for him. During the period which followed the execution of Savonarola we find that B. became a devoted follower of that friar, and all his works of this period are marked by the strong religious conviction which he seems to have felt. To this period are [illegible] 'The Nativity' and [illegible] 'Cross.' After the [illegible] 6th century we [illegible] of him; we how [illegible] ting on committees of his fellow artists. Through all his paintings there runs the vein of poetical and mystical fantasy. Side by side, however, with his capacity for strong religious convictions ran the rough and ready humour of the Florence of his time. He died in May, probably not very well off, but at all events with sufficient of this world's goods to keep him from penury and want.

Böttiger, Carl Vilhelm (1807-78), a Swedish author, was made professor of æsthetics at Upsala University in 1856, and professor of modern literature two years later. He succeeded his father-in-law, Esaias Tegnér, bishop of Vexio, the greatest of Swedish authors, as a member of the Academy. He wrote principally lyric poetry, distinguished by graceful sentiment and style, though sometimes inclined to morbidity. He pub. also an admirable series of monographs on Swedish men of letters. His collected works have been pub. in six vols.; the best known are *Nyare sanger*, 1833, and *Lyriska Stycken*, 1837-39.

Böttiger, Karl August (1760-1835), Ger. archæologist, after holding the [illegible] (1784), and [illegible] prin. of the (1791), where he was intimate with Wieland, Goethe, and Schiller. His inexhaustible store of literary energy was dissipated between studies on a Roman lady's toilet, anct. Gk. sculpture, court pages, etc. His voluminous writings are now regarded as learned compendia of interesting information.

Bottini, Enrico (1837-1903), an It. surgeon, was born at Stradella, in the prov. of Pavia. He was appointed lecturer in obstetrics and surgery at Novara in 1865, a post which he held until 1877, when he was appointed professor of surgery at Pavia. He was, however, obliged to resign his professorship in 1887, in which year

he was elected member of parliament for his native tn. He was afterwards a member of the Chamber of Deputies and then took up his professorial chair again before he retired to San Remo, where he died. His work on the use of carbolic acid in operations was pub. in 1866; he was also noted for his skill in operative surgery. He was among the first to recognise how parasitic organisms help to cause diseases.

Bottle (from Fr. *bouteille* (through dim. of Lat. *botta*, a flask); from this is also derived the Eng. *butt*). The word denotes a vessel, usually of glass, with a narrow neck, for containing liquids. The first Bs. were probably made of skins. The art of making glass Bs. and drinking glasses was known to the Romans at least before the year 79, for these articles and other vessels have been found in the ruins of Pompeii. In the *Iliad* the attendants are represented as bearing wine for use in a B. made of goat's skin. The anct. Egyptians used skins for this purpose, and also the Greeks and Romans. In Southern Europe Bs. of skin are used for transport of wine, and in parts of Asia and Africa for carrying and storing water. The Egyptians also had vases and Bs. of stone, alabaster, glass, bronze, silver, and gold. The Phœnicians and Romans made Bs. of glass and stone. Reference to skin Bs. is made in the N.T. in the phrase 'Put new wine into new Bs.,' signifying that old Bs. being cracked and thin would easily burst from the pressure of the gas from the new wine. Bs. were made in England about 1558. A B. which contained two hogsheads was blown at Leith in Scotland in January 1748. In modern times Bs. are usually made of glass. In Chicago Bs. made of paper were invented in 1887 and were largely used. They are light, cheap, and unbreakable. The insides are fitted with a composition which is intended to resist the action of dyes, acids, and spirits, etc. Glass B. making is a flourishing and advancing industry and great developments have been made. In 1886 appeared Ashley's patent for making glass Bs. by machinery. A few years later screw-stopped Bs. were in universal use for aerated waters. Labour-saving machinery for filling has been introduced, and the latest developments are machines for corking, stopping, labelling, and washing. In England the glass-making industry is chiefly carried on at St. Helens and Sunderland, and also in the 'Potteries' district. The work is very unhealthy on account of the chemicals used.

Bottle Chart, *see* OCEAN.

Bottle Gourd is the name given to the hard outer skin of the fruit of the calabash-cucumber, which makes a useful water-bottle. The plant on which it grows is a member of the order Cucurbitaceæ, and is known as *Lagenaria vulgaris*.

Bottle-nose is a name applied to various species of cetaceous mammals of the family Physeteridæ and genus *Hyperoodon*, which are closely related to the sperm-whales. These whales yield spermaceti and oil; they can dive very deeply and remain under water for a long time. *H. rostratus* is about 30 ft. long and is found in the N. Atlantic.

Bottling Machine, the general term applied to a machine for filling bottles with any liquid, such as medicine, scent, spirituous liquors, etc., so that the air is excluded. The bottle must first be prepared by a thorough cleansing with hot water and soda, followed by a final washing in pure cold water. The common form of machine is simple in construction. It consists of an open tank from which run siphon tubes, usually six in number. Below these runs a shelf on which the bottles rest, while lower still is a trough to receive waste liquid. The operator starts the machine by sucking the siphon tubes in turn and putting a bottle on each tube. As each bottle is filled, it is removed and another substituted. Some machines work by gas pressure in a closed tank instead of by siphonage. Codd's machine, for the bottling of aerated waters, is by far the best of the kind, but is more complicated than that described.

Bottom Heat, a term in horticulture expressive of an artificial temperature communicated from below by means of fermenting vegetable matter to the soil in which plants grow. It is used in order to keep the temperature between the degrees of 60 to 90 F. in forcing vegetables, flowers, or fruits.

Bottomley, Horatio W., became Liberal M.P. for Hackney in 1906. As a 'lay lawyer' he successfully defended his two cases of Regina *v.* Bottomley in 1893, in connection with the Hansard Union, which wound up in 1891, and Rex *v.* Bottomley, 1909, which was the culminating point of the proceedings against him in connection with the Joint Stock and Finance Corporation of which he had been chairman and which had gone into liquidation in 1906. As a journalist and newspaper proprietor he founded the *Financial Times*, and was connected with sev. other papers, becoming eventually proprietor of the *Sun* newspaper. This was taken over by the *Globe* people and died shortly afterwards,

while Mr. B. is at present acting editor of *John Bull*, the first issue of which appeared on June 9, 1906. He also founded a companion paper, *Mrs. Bull*. In addition to being perhaps the best 'lay lawyer' of his time and a successful race-horse owner, he sat in parliament as an Independent Liberal, and attempted to popularise the phrase 'Business government.' His denunciation of the 'Party System' in politics met with a more ready acceptance, but he resigned his seat in 1912.

Bottomry is a maritime term. When it is a matter of vital importance to raise money for the proper completion of a ship's voyage, and there is no time to communicate with the owners, and the master has exhausted every other means for raising money then he may 'hypothecate' the vessel, and, in some cases, the cargo, *i.e.* he may give a bond or written contract for the loan of the money advanced on the security of the ship and freight. This bond binds the owners to repay the loan within a limited time after the safe arrival of the ship, but if the ship does not arrive safely the money is not repaid. The holder of a B. bond has a right to be paid before a mortgagee, but will not be paid until claims for wages or salvage have been satisfied. Where sev. bonds have been given, the last-comer takes priority over the others.

Bottrop is a tn. of Germany in the prov. of Westphalia. It has manufs. of gunpowder and machinery. Pop. 15,000.

Botzen, or Bozen, is a tn. of the Tyrol, Austria-Hungary, situated at the confluence of the Talfer and the Eisach, 35 m. N.N.E. of Trent. It has a church dating from the 14th century, and fine public squares; it is protected from the inundations of the Talfer by a dyke 2 m. in length, which serves as a promenade. It is in the midst of a rich fruit region, and is a well-known summer resort. The site of the Roman Pons Drusi is supposed to be here. Pop. 15,000.

Bouch, Sir Thomas (1822-80), civil engineer, was born at Thursley in Cumberland. His very earliest tastes were for engineering, and in 1839 he began his career [illegible]. After this he w[illegible] Stockton and [illegible] and in 1849 became manager and engineer of the Edinburgh and Northern Railway, and it is to him that the Forth and Tay owe their 'floating railways.' He was the engineer of the Tay Bridge, finished in 1877, for which the freedom of the town of Dundee was conferred upon him. He was also made a knight. The disaster of the Tay Bridge in 1879 was the cause of his health giving way, owing to mental shock, and of his death in the following year.

Bouchain, a Fr. vil. in the dept. of Nord, in the arron. of, and 12 m. from, Valenciennes, on the Seusée and the Escaut. Pop. 1800.

Bouchardon, Edme (1698-1762), a famous French sculptor, born at Chaumont. He studied in Paris under the younger Couston, and later in Rome. His best known work is the 'Fountain of Grenelle,' in Paris, while an equestrian statue of Louis XV. was destroyed in 1792. He also executed a number of smaller works of merit.

Boucher, François (1703-70), a Fr. painter, born at Paris. Studied at Rome, and became member of the Academy in 1734. In 1765 he was given a position as painter to Louis XV. He was an artist of much ability and was equally facile in the production of figure or landscape pictures. The number of his pictures and drawings is said to have exceeded 10,000, and he also executed engravings. He became director of the Fr. Academy, which post he retained until his death.

Boucher, Jonathan (1738-1804), an English clergyman and political writer. He was born at Blencogo, near Wigton in Cumberlandshire, but emigrated to Virginia about 1757, where he was engaged in teaching. Determining to take holy orders, he returned to England, and was ordained in 1762, and, in the same year, became rector of Hanover, King George co. He held this and subsequent charges until 1775, when he was obliged to resign, owing to his proclaimed Royalist views. Driven from the country by the Revolution, he returned to England, where he was presented to the vicarage of Epsom in Surrey, which he retained until the time of his death. B. during his residence in America had been on terms of close friendship with Washington, intimacy only being broken by their differences regarding Americ[illegible] on [illegible] are [illegible] beir[illegible] *sequences of the American Revolution*, 1797—a collection of some of his discourses delivered between 1763 and 1775. He devoted many of the last years of his life to the compilation of *A Glossary of Archaic and Provincial Words*, which was uncompleted at the time of his death. Two unsuccessful attempts were made to publish this work.

Boucher de Crèvecœur de Perthes, Jacques (1786-1863), born at Réthel, was an anthropologist and writer. He was employed by Napoleon in

various missions to Italy, Germany, and Austria. After the Restoration he lived at Abbeville. He wrote poems, travels, and works in archæology. His chief work on the latter subject is *De la Création*. His long investigations on stone weapons and other remains of early human civilisation in tertiary strata made him famous.

Bouches-du-Rhône, a maritime dept. of S.-Eastern France, situated at the mouth of the Rhone. It has an area of 2000 sq. m. It consists of three arrons., viz., Marseilles, Aix, and Arles. The western portion, known as the Camargue, is a marshy and unhealthy plain. The Maritime Alps slope down through the N. and E. to the basin of the Rhone. The beautiful Mediterranean climate is affected by the mistral. The amount of arable land is very small. Wheat and oats are grown in the Camargue and the plain of Arles, and olive trees are largely grown in the N.E. The vine is also cultivated. The salt marshes employ thousands of workmen, and the dept. produces more salt than any other dept. Iron is worked, and there are large coal and lignite mines. Among the chief industries are oil distilleries, metal founding, soap and

seaport of France. Shipbuilding is carried on here. The pop. is about 737,112.

Boucicault, D. (1822-90), Irish dramatist and actor, born at Dublin, and died at New York. Educated at University College, London, and before he was twenty years old he made an immediate success with *London Assurance*, at Covent Garden, in 1841. He rapidly produced other pieces, among them *Old Heads and Young Hearts*, *Louis XI.*, and *The Corsican Brothers*. He made his first appearance as actor in 1852, in a play of his own, *The Vampire*. From 1853-60 he was in America. On his return to England he produced the first of a series of Irish plays, entitled *Colleen Bawn*, at the Adelphi Theatre. This *Arrah-na-* ing in these pieces won for him a high reputation as an actor. He returned to America in 1875, and came back to England to play in *The Jilt* in 1886. His latest successes are *Streets of London* and *After Dark*.

Boué, Ami (1794-1881), Austrian geologist, whilst studying medicine at Edinburgh, came under the influence of Robert Jameson, who inspired him to make a geological expedition to the Hebrides. Later he studied, often as pioneer, geological formations in Germany, Austria, and Turkey. His *La Turquie d'Europe* (1840) may be quoted from a long catalogue of publications.

Boufarik, a tn. of Algeria, 23 m. S. of Algiers by rail. Pop. 4621.

Boufleurs, Louis François, Duc de (1644-1711), a marshal of France who attained great distinction, and was descended from one of the oldest families in Picardy. Serving under Condé, Turenne, Créqui, and Catinat, he attained rapid promotion, and his marshal's baton in 1693. His masterly defence of Namur in 1695 against William III., and of Lille in 1708 against Prince Eugene received recognition by the king, and he was made a duke and peer of France. His ability was clearly shown by the manner in which he conducted the retreat from Malplaquet in 1709; his death occurring on August 22 at Fontainebleau.

Boufflers, Stanislaus, Marquis de, son of the Marchioness of Boufflers, mistress of Stanislaus, King of Poland, was born at Lunéville in 1737. He was distinguished for his elegance of manners and conversation. He was destined for the church, but abandoned the idea and entered the military service. He emigrated from France to Prussia in 1792. His works consist of poems, travels, 'eloges,' and tales, and have been many times repub. In 1784 he reached the grade of maréchal-de camp, and in 1785 he became governor of Senegal in Africa. His character is summed up in the following epigram, attributed to Antoine de Rivarre, 'Abbé libertin, militaire philosophe, diplomate chansonnier, émigré patriote.'

Bougainville is the name given to the largest member of the Solomon Islands which belongs to Germany. Bougainville was a Fr. navigator of the 18th century. He landed here about 1766 when on a voyage of discovery round the world.

Bougainville, Louis Antoine de (1729-1814), first Fr. circumnavigator, born in Paris. Studied law, but entered the military profession in 1753. At the age of twenty-one he pub. a treatise on the integral calculus as a supplement to De l'Hôpital's treatise, *Des infiniments petits*. In 1755 he became secretary to the French embassy in London. In the next year he went to Canada as captain of dragoons and aide-de-camp to Montcalm. He was rewarded with the rank of colonel and the cross of St. Louis. He served in the Seven Years' War. He undertook the task of colonising the Falkland Is., but the Fr. gov. gave it up to the Spaniards. He then went on a

voyage of discovery which lasted two years four months. Saw active service in the navy, became vice-admiral in 1791. He was a senator under Napoleon I., a Count of Empire, and a member of the Legion of Honour. Died at Paris.

Bougainvillea is a S. American plant of the order Nyctaginaceæ. The flowers are arranged in groups of threes, and are surrounded by an involucre of petaloid bracts, red or lilac in colour. *B. spectabilis* is a beautiful tropical creeper with lilac-coloured bracts.

Bough, Samuel (1822-78), landscape painter, son of a shoemaker, was born at Carlisle on Jan. 8, and when a boy assisted at his father's craft. Later he became a clerk in the office of the tn. clerk, but abandoned the prospect of a law career, and wandered about the country making sketches and living a Bohemian life. He never visited a school of art. In 1845 he obtained employment as scene-painter at Manchester and later at Glasgow, where he married a singer, Isabella Taylor. His abilities were recognised by Sir D. Macknee, who advised him to give up his work at the theatre for landscape painting. In 1849 he began a more earnest study of nature, working at Hamilton and Port-Glasgow. He also supplied landscape illustrations for books pub. by Blackie and Co. He became an associate of the Royal Scottish Academy in 1856, and a full member in 1875. He died at Edinburgh. He painted chiefly in water, he loved music, and was a good bass singer. Chief pictures are 'Shipbuilding at Dumbarton,' 'Canty Bay,' 'The Rocket Cart,' and 'Borrowdale.'

Boughton, George Henry (1836-1905), an English painter, took up his residence in London in 1862. He was chosen associate of the Royal Academy in 1879, and member in 1896. He exhibited many pictures at the Royal Academy, which are characterised by much grace and beauty. He pub. a vol. of sketches in 1886 in conjunction with E. A. Abbey. The Tate Gallery has his picture entitled 'Weeding the Pavement.'

Bougie, a cylindrical instrument made of waxed silk or other suitable material which may be passed into the gullet, urethra, or other passage for the purpose of dilation or examination. The term is also applied to a long and thin suppository shaped in moulds or glass tubes.

Bougie, a seaport of Algeria, 120 m. E. of Algiers. It is beautifully situated on the slope of Mt. Gurava, and is defended by a wall since the Fr. occupation. It is an ancient town, and was the Saldae of the Roms. In the 5th century it was the chief seat of the Vandals. Under the Arabs it was named the little Mecca. The tn. fell into decay after the 16th century, and when captured by the Fr. in 1833 it consisted of little more than a few fortifications and ruins. It has now become a strong fortress and a port of great commercial value. The Fr. word for 'candle' is probably derived from the name of the town, candles being first made of wax imported from Bougie. Pop. 10,419.

Bouguer, Pierre (1698-1758), eminent Fr. mathematician. His father was regius professor of hydrography at Croisic, Lower Brittany. At an early age young B. succeeded his father as professor. In 1727 he gained a prize given by the Academy of Science for his paper 'On the best manner of forming and distributing the masts of Ships,' and also prizes for 'Essays on the best method for observing the stars at sea,' and 'The best method of observing the variation of the compass at sea.' In 1729 he pub. *Essai d'optique sur la gradation de la lumière.* He became professor of hydrography at Havre, and succeeded Maupertuis as associate geometer of the Academy of Science. In 1735 he went to Peru to measure a degree of the meridian near the equator.

Bouguereau, Guillaume Adolphe (1825-1905), Fr. painter, born at La Rochelle. Studied art at the Ecole des Beaux Arts during the years 1843-50, when he won the Grand Prix de Rome. This enabled him to study in Italy until 1855. In 1847 he began regularly to exhibit at the Salon. In 1855 he exhibited 'The Martyr's Death' (the body of St. Cecilia borne to the Catacombs), which was afterwards placed in the Luxembourg. He

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best in classical and antique paintings, for his modern works show a lack of ease in the treatment of modern costume. Among his chief works are: 'The Four Divisions of the Day,' 'A Bacchante,' 'The Return from the Field,' 'Return of Spring,' 'Homer and his Guide,' 'The Consoling Virgin,' 'Triumph of Venus,' 'Philometa and Procne,' 'The Little Beggar Girls.' He was vice-president of the Society of Artists, a member of the Legion of Honour in 1856, an officer of the order in 1876, and commander in 1885.

Bouhours, Dominique (1628-1702), Fr. critic, born in Paris. Entered the society of Jesuits, and was appointed to read lectures on literature in the college of Clermont at Paris, and on rhetoric at Tours. He became preceptor of the two sons of the Duke

of Longueville, who died in B.'s arms. He wrote an account of the death of his former patron. B. was sent to Dunkirk to the Romanist refugees from England, and he pub. sev. books during his missionary work there. Among these was *Les entretiens d'Arisle et d'Eugène*, a critical work on the Fr. language. Other works are *La manière de bien penser sur les ouvrages d'esprit*, *Remarks and doubts upon the French Language*, and a *Life of St. Ignatius*. It was his practice to publish alternately a book on literature and a work on some subject of piety. His criticism on *Pensées ingenieuses des Anciens et des Modernes* was the subject of much ridicule on account of its strange misjudgments and omissions. Died at Paris.

Bouillabaisse is the name of a Fr. dish, popular especially in Provence. It is composed of a large fish, to which is added sev. smaller ones cut up; onions, saffron, sliced tomatoes, olive oil, etc., are then put in, and the whole cooked in a casserole.

Bouillé, François Claude Amour, Marquis de (1759-1800), was a distinguished Fr. general, celebrated for many exploits before the era of the Revolution. He held liberal principles and sat in the first assembly of the Notables, and after making excellent though abortive preparations to assist the unfortunate Louis XVI. in pursuing his journey from Varennes after his flight from Paris, he quitted France and served under the allies. He died in London. His *Memoirs of the French Revolution* rank deservedly high.

Bouillon, a fortress in the prov. of Luxembourg, Belgium. Situated on the R. Semoy, 9 m. S.E. of Sedan. Pop. 3000. Here Napoleon III. of France spent the first night of his exile after the battle of Sedan, 1870.

Bouillon, Godfrey de (c. 1058-1100), one of the commanders of the first crusade, and the eldest son of Eustace II. of Boulogne and Ida, sister of Godfrey, Duke of Lower Lorraine. There are many legends woven round his name and deeds, and he was undoubtedly a man of great personal strength and gallantry. Godfrey, or Godefroy, after the capture of Jerusalem, is said to have been offered the title of king, which he declined for that of defender of the holy sepulchre, refusing 'to wear a crown of gold where his Saviour had worn a crown of thorns.'

Bouilly, Jean Nicolas (1763-1842), Fr. author and dramatist, was born near Tours on Jan. 24. At the commencement of the Revolution he held sev. high offices under the new gov., and was largely responsible for the organisation of primary education. He retired from public life in 1798, and devoted himself to literature. He wrote the musical comedy *Pierre le Grand* for Grétry's music, the opera *Les deux Journées* to Cherubini's music, and *L'abbé de L'épée*. Among other books he wrote the following: *Causeries d'un Vieillard*, *Contes à ma Fille*, *Les Adieux du Vieux Content*.

Bouin, a port of Vendée, France, situated 40 m. S. of Sables d'Olonne. Fishing is carried on. Pop. 3000.

Boulainvilliers, Henri de, Comte de St. Saire (in Normandy) (1658–1722), political writer and historian, works not pub. in his lifetime. Some of the chief are: *Histoire de l'ancien Gouvernement de la France*, *Histoire de la Pairie de France*, *Etat de la France*.

Boulak, or Bulak, is the port of Cairo, situated on the Nile; it is connected with Cairo by an electric tramway and forms a north-western suburb of the city. It formerly contained the famous Egyptological Museum, now removed to Cairo. The great national printing establishment, founded by Mehemet Ali, is situated at Boulak.

Boulanger, George Ernest Jean Marie (1837-91), a Fr. general, born in April at Rennes. He entered the army in 1856, and estab. his reputation as a soldier by services in Italy Cochin-China, and in the Franco-Prussian War. He was during this latter campaign at Metz, but escaped to Paris, and fought there under the provisional gov. In 1880 he was made brigadier-general and given the command of an army corps, this advance being due principally to the influence of the Duc D'Aumale. He had represented France at the centenary of the Declaration of Independence in America in 1876. As director of infantry at the War Office, a post to which he was appointed in 1882, he made a name as a reformer. His reforms were alike pleasing to the rank and file of the army, but his great reputation was due to his attitude towards Germany in 1887. On all sides now he was regarded as the man who would avenge the defeats of 1870. In 1884 he had been commander of the army at Tunis, and in 1886 his position in the political world was recognised by his appointment to the post of war minister. As war minister he got rid of his former patron, the Duc D'Aumale, erasing his name from the list of active generals. On all side[illegible] piece of deli[illegible] denied the [illegible] which he l[illegible] 1880; his contradiction, however, in face of [illegible] letters themselves, [illegible] His tremendous [illegible] suffer, however, by this rebuff. In 1887 he came out

of office with the ministry, and although the populace clamoured for his reappointment in the next cabinet, he was not appointed. He was, however, given the command of an army corps. B. was now the most popular man in France, and was urged to run for the presidency. In 1888 he was deprived of his command and taken off the list of active officers for various acts of insubordination. He immediately entered politics and started an agitation for the revision of the constitution. Most politicians now saw what this movement would end in, and even some of his moderate supporters were beginning to be alarmed. He [illegible] protest, and [illegible] by an over[illegible] one of the [illegible] point had [illegible] blow he might have been successful, but he failed to seize his opportunity, and in the April following he fled the country on the issue of a warrant for his arrest on a charge of treason. The Boulangist movement survived his voluntary exile for a little. In Oct., in his absence, he was condemned for treason. Finally, after settling in Jersey, he committed suicide in Sept. on the grave of a mistress in Brussels.

Boulangerite (named after one of its discoverers, Boulanger, a Frenchman), a non-crystalline mineral of the colour of lead. It exists in bacillary, amorphous masses, slightly granulated. The formula for B. is $Pb_3Sb_2S_6$ and the sp. gr. 8 to 6.

Boulay de la Meurthe, Antoine (1761-1840), Fr. politician, son of an agric. labourer, born at Chamousey in the Vosges, on Feb. 19. He acquired a reputation as a lawyer and speaker, and supported the revolutionary cause. He re[illegible] the Council of [illegible] known as an [illegible] and of the Directory despotism. Under the empire he helped to compile the Civil Code. Received the Grand Cross of the Legion of Honour, and the title of count. He was a member of Napoleon's privy council. He died in Paris. His publications include two books on English history.

Boulder is the chief tn. of B. co., Colorado, United States. It is situated at the foot of the Front Range on B. Creek. It is the centre of a large mining dist. It is served by the Union Pacific, and the Colorado and North-Western railways.

Boulder Clay (Ger. *Blocklehme*, or *Grundmoränë*; Swedish *Krossten-slera*; Fr. *argile à blocaux*) is a kind of cla[illegible] [illegible]at has a very [illegible] It is found [illegible] Scandinavia, Holland, Germany, Central and Northern Russia, and other mountainous dists. of Central and Southern Europe. It varies in depth from a few ft. to 20 or 30 yds.; as a rule the depth varies with the height of the place it is found in, the thickest deposits being in low-lying dists. It contains all sizes of stones, from pebbles to huge boulders, the stones found being local in character. They are generally worn smooth, and bear traces of having been subjected to great pressure. The B. C. takes the colour of the underlying rocks; thus the clay over Triassic and Old Red Sandstone rocks will be red; over carboniferous formations, black; over Silurian rock, buff or grey; and over chalk formations, white. In some low-lying dists. the B. C. is arranged in what are known as 'drums' or 'sowbacks;' these are long parallel banks of which the general direction is in correspondence with the course taken by the boulders therein, and also with the marks, or strie, on the underlying rocks. Examples of such formations may be seen in Nithsdale and in the lower valleys of the Teviot and the Tweed. The 'crag and tail' formation may be observed also in these and other regions. B. C. is often found piled up on the side of a prominent hill, the face of which faces the direction in which the boulders in the clay have travelled; this is known as 'crag and tail.' Examples of such are to be seen on isolated hills near Edinburgh, and notably in Edinburgh castle. B. C. is unfossiliferous, save for foraminifera, which have been found in widely separated regions. Other names for it are 'Till' or 'Ground Moraine.' It is now generally believed to have been formed by glacial action.

Boulders, Erratic, are masses of rock sometimes washed out of the boulder clay which is itself worn away by the action of the sea. They are formed beneath glaciers, but these boulders are often found some distance away from their place of formation, as they are carried along by river streams. The borders of the Canadian lakes are covered with boulders which are sometimes carried for hundreds of miles by the river. The Labrador coast, again, is strewn with numbers of boulders, and these were either lifted up from the sea or brought down by glaciers, or else they fell from the steep cliffs. In N. America some of the E. B. are angular, but most of them have been worn away by friction. In parts of the Baltic Sea the water becomes frozen, and when it melts, the stones that [illegible] carried [illegible] netimes [illegible] it on to

the coasts of the surrounding countries. A boulder of considerable weight was used for the base of the statue of Peter the Great in St. Petersburg, this boulder having been found near the city.

Boule (Gk. βουλη, advice, thence 'council') was a general term in anct. Greece for an advisory council. Such councils existed from Homeric times in most Gk. states, but the only one of which we have any detailed information is the Athenian B. For details of this see the articles on GOVERNMENT and ATHENS.

Boulenger, or Boulanger, Pierre Emmanuel Hippolyte (1837-74), Belgian landscape painter, studied in Brussels Academy and at Tervueren. Exhibited at Brussels exhibition, 1866, at Ghent, 1867, his pictures winning much notice. The institution of the 'Société Libre des Beaux-Arts' (1868) was largely due to his influence, also its journal, *L'Art Libre* (1871). In 1872 B. won a medal for his 'Allée des Charmes.' He exhibited 'Environs de Tervueren' at the Salon (1873), and 'Spring-time in Brabant' at International Exhibition at Kensington, 1874. *See* Lemonnier, *Histoire des Beaux-Arts en Belgique*, 1881.

Boulevard (Fr., *cf.* Ger. *Bollwerk*, Eng. bulwark), originally applied to the rampart or outer fortification of a tn. In France and Germany these ancient fortifications have frequently been demolished, levelled, and the broad space, thus obtained, planted with trees and used as a promenade. Hence the term now denotes a broad avenue, designed for walking or driving. The most celebrated Bs. are those of Paris.

Boulger, Demetrius Charles (*b.* 1853), is an Eng. publicist and student of Oriental affairs. He founded the Asiatic *Quarterly Review* in 1885, and was the editor for the first five years. His political contributions to the Eng. reviews are invariably characterised by accurate knowledge and keen judgment. His works include: *England and Russia in Central Asia*, 1885; *Life of Gordon*, 1896; *History of China*, 1900; *India in the 19th Century*, 1901; *History of Belgium*, 1902, etc.

Bouliguine, A. G. (*b.* 1851), is a Russian politician and administrator. In 1871 he was appointed judge of Tambov, and three years later entered the Ministry of the Interior. After having been vice-governor of Tambov from 1887 to 1893, he was made governor of Moscow. His chief, the Grand Duke Sergius, was assassinated on Feb. 17, 1905; B. in the same year took the place of Prince Svîatopolk-Mirsky as Minister of the Interior.

Boulimia, or Bulimy, insatiable hunger (Gk. βους and λιμός), a state of ill-health due to various causes. The patient has a constant, morbid craving for food. Sometimes occurs in nervous disorders.

Boulogne-sur-Mer, a seaport in the dept. of Pas-de-Calais, France. It is situated at the mouth of the R. Liane, on the Eng. Channel, 22 m. S.W. of Calais, and it is connected with England by a daily Channel service to Folkestone. It is the Bononia Gessoriacum of the Romans. Henry VIII. took the tn. in 1544, but it was restored to the Fr. in 1550. Napoleon I. mustered his ar[illegible]802, and a colum[illegible]ty, 176 ft. high, statue of Napoleon, commemorates his projected invasion of England. The cathedral of Notre Dame, in the It. Renaissance style, was erected (1827-66) on the site of the Gothic cathedral, which was destroyed during the Revolution, and of which only the crypt remains. The chief exports are dried fish, wine, leather, watches, and textiles. The chief industry is herring, cod, and mackerel fishing; and there are manufs. of soap, pens, glass, carriages, and cement. It is a popular seaside resort in the summer. It is the bp. of Sainte-Beuve (1804-69) and Mariette (1821-81). Pop. (1901) 49,083. Consult Vivenot, *Notice sur la Port de Boulogne*, Paris, 1904.

Boulogne-sur-Seine, a tn. of France in the dept. of Seine, adjoining the Bois de Boulogne, Paris. It has linen bleacheries, chemical works, and perfume factories. Pop. (1901) 44,416.

Boulonnais, the name of a former div. of France, now situated in Picardy. Its cap. was Boulogne-sur-Mer.

Boulton, Mathew (1728-1809), Eng. engineer, born at Birmingham. He succeeded (1759) to his father's business of silver stamper and piercer. So great were his improvements and extensions that in 1762 he removed his works to Soho, just N. of Birmingham. A new method of inlaying steel was one of his first achievements. He formed a partnership with the great James Watt (1775). They joined in improving coining-machinery, and produced a new copper coinage for Great Britain in 1797. That same year a patent was granted B. for his method of raising water by impulse. B.'s life-work was to promote the commercial interests of England. Consult Smiles' *Lives of Boulton and Watt*.

Boundary (O. Fr. *bodne, bonde*, Med Lat. *bodena*, from *butina*, frontier line), that which marks the limit of land. The B. may be indicated by a post, ditch, hedge, march of stones, road, or riv., or it may be indicated by refer-

ence to a plan, or to possession of tenants, or by actual measurement. When property is divided by a road or riv., the middle line of the road or riv. is said to be the property; whereas a hedge or fence is taken to belong equally to the adjoining owners. The Bs. of tns. and parishes depend upon anct. charter or custom. The Local Government Acts of 1888 and 1894 provided for the local readjustment of local areas, subject in certain cases to the confirmation of parliament. The Reform Acts of 1832, 1867, and 1884 defined political Bs., which frequently differ from municipal ones. In law, the exact B., whether public or private, is a matter of evidence, and where there is no evidence, the court acts on presumption. The presiding authority of a local board in England, or of a police bor. in Scotland, finally defines the B., which is then publicly recorded. In Scotland, a bounding charter describes the limits of land. For further information, refer to the Commission Reports of 1868, 1870, 1873, and 1888.

Bounds, Beating the, the popular name in England for the anct. custom o of the p · Ascens accompanied by his parishioners, and the masters and boys of the parish school, used to make a survey or perambulation of the important parish boundaries, which the boys beat with willow wands. Sometimes the boys themselves were whipped at particular stations. This annual ceremony, held to preserve the limits of a parish, may be compared with the Rom. festival, Terminalia, celebrated on Feb. 23. In Scotland, alternative names are 'riding the marches' and 'common riding.' At Shrewsbury it was called 'bannering,' and the custom was kept up till the middle of the 19th century. *See* Brand's *Popular Antiquities.*

Bounty, in political economy, a sum granted directly or indirectly by a government to producers, manufacturers, etc., for the purpose of encouraging the particular industry, usually taking the form of a subsidy on quantities of goods exported from the country. Bs., or subsidies as they are also termed, were used much in Great Britain under the former mercantile system, examples being those on the herring fisheries, which, it is said, cost the state more than the price of the herrings as sold in the open market; the linen export Bs., abolished in 1834; and the corn export Bs., abolished in 1814. Foreign countries, which frankly adopt a protectionist standpoint, have, and still do grant, Bs. to stimulate industries which are of importance to the country apart from their commercial value, *e.g.* the French Shipping Bs., as a support for the navy; but, with one exception, the sugar Bs. (*see* SUGAR and BRUSSELS SUGAR CONVENTION) state trade subventions usually take more indirect methods, in the form of rebates, drawbacks, etc. From the point of view of economics, Bs. are objected to as penalising the consumer, the taxpayer, to benefit an individual trade; as withdrawing capital to an industry which without the B. would decline, and should therefore be regarded as doomed to extinction, and, as proved by past history, have been in themselves unnecessary or even harmful, as in the case of the linen Bs. and herring fishery Bs. Apart from economic Bs., the word is applied to the money premiums formerly paid on enlistment for the army and navy in Great Britain and Ireland, which varied in amount during the great Napoleonic wars from £18 to over £20 a head. In the old militia forces Bs. of £2 were paid on enlistment. Bs., or 'B. money,' is paid to a mercantile ship's crew for salvage service, and payments are made to the crew per head for slaves taken by a British ship from a slaver. Special forms may be mentioned, viz. the King's B., a donation of £3 granted by the sovereign to the mother of triplets.

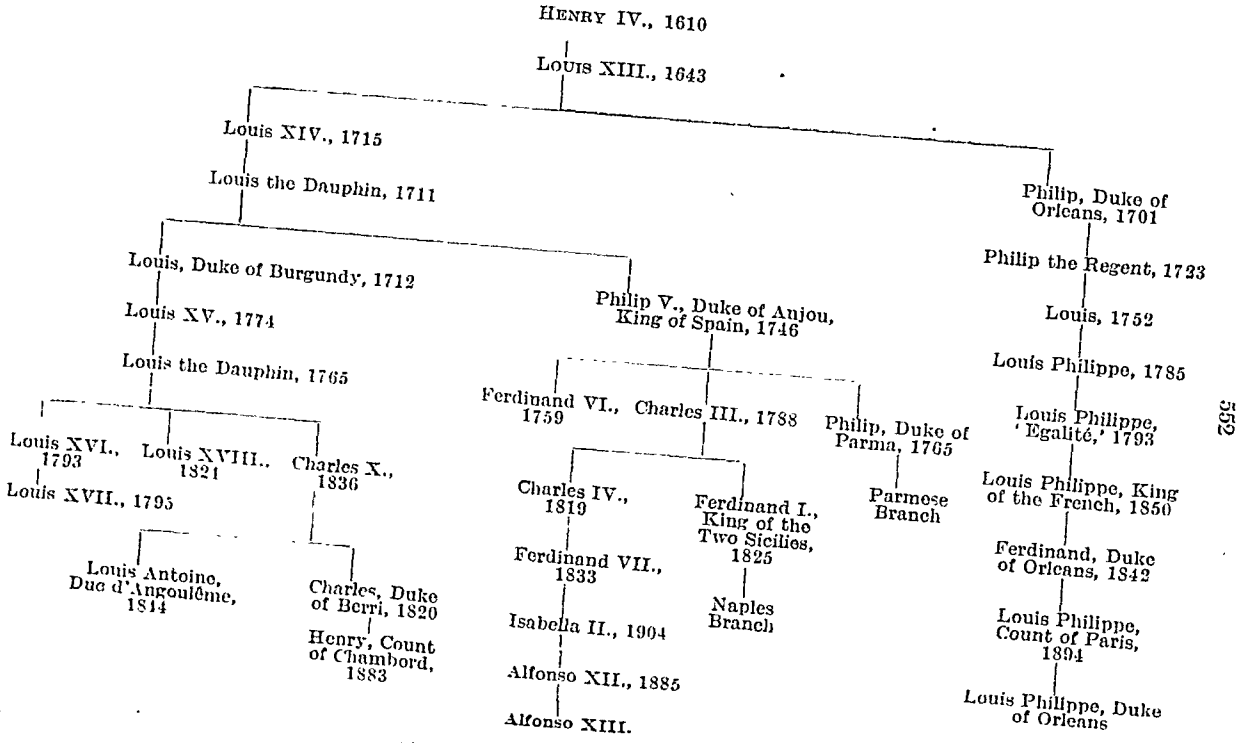
Bounty, Queen Anne's, an eccles. fund, founded in 1703, when the tithes, etc., originally paid to the pope, and later to the crown, were reserved for this bounty. Its purposes are to augment small livings, to build parsonage houses, and generally to make grants for eccles. purposes.

Bounty, Mutiny of the. H.M.S. *Bounty* was an Eng. vessel sent out in 1787 to Tahiti, under William Bligh, to collect plants of the bread fruit tree for the W. Indian colonies. On the return Bligh's crew mutinied under his harsh treatment, turning him and the few who were loyal to him adrift. They finally reached land in safety. In 1808 Bligh was appointed governor of New S. Wales, but proved so tyrannical that he was soon dismissed. He returned to England and was made an admiral. Of the mutineers some returned to Tahiti and were captured and punished; the rest settled on Pitcairn Is. (between S. America and Australia) in 1790. There were quarrels among the native Tahitians, and massacres took place, in which most of the Englishmen were murdered as time went on. Gradually, however, a little colony was formed under the surviving Englishman, John Adams, who died 1829. Lord Byron used this incident in *The*

Island. For further details consult Barrow's *Mutiny of the 'Bounty,'* Beechey's *Voyage to the Pacific*, or Bligh's *History of the 'Bounty's' Voyage*.

Bourbaki, Charles Denis Sauter (1816-97), a Fr. general, born at Pau, educated at Saint-Cyr; entered the army in 1836, and served in Algeria, the Crimea, and Italy, distinguishing himself particularly at Alma and Inkerman (1854), and at Solferino (1859). In the Franco-Ger. War, he commanded the Imperial Guard, and took a prominent part in the fighting round Metz, after which he was sent on a secret mission to the Empress Eugenie in England. For a short time he was at the head of the army of the North. He met with a severe repulse at Belfort (1871), and on his retreat attempted suicide. He became corps-commander at Lyons in the same year, and retired in 1881. Consult Grandin, *Le Général Bourbaki*, Paris, 1897.

Bourbon, a Fr. family which for over three generations occupied the throne of France, has given monarchs to Naples, and still at the present day occupies the throne of Spain. The family seem to have taken their name from, and trace their descent back to, the early part of the 10th century. The name B. is taken from the territorial possessions of one Adhémar, lord of the barony of Bourbonnais, a ter. lying away in the centre of France and represented by the modern dept. of Allier. Adhémar seems to have been able to trace his descent from Charles Martel, the great Carolingian. The family of B. early in its history became allied by marriage to the house of Dampierre, and in 1272 it became allied by marriage to the royal Capetian house, by the marriage of Agnes, heiress of the house of B., with the sixth son of Louis IX. The son of this marriage received the title of the Duke of B., but before the end of the 15th century this line had become extinct, and the duchy had passed into the possession of another branch of the family. With the great Constable, Charles B., the direct line from the first B. duke came to an end. A younger branch of the line took up the title in the person of Louis, Duke of Vendôme, and in direct descent from him was Antoine, King of Navarre by marriage, and heir to the B. title and name. His son was the famous Henry of Navarre who in 1589 became King of France as Henry IV. Henry IV. was assassinated in 1610, and was succeeded by his son, Louis XIII., who died in 1643, and was succeeded by his son, the 'grand monarque,' Louis XIV. Louis XIV. reigned from 1643-1715, and lived to see France undergo many vicissitudes. He was succeeded by his great grandson Louis XV., but before his death had succeeded in establishing the present B. dynasty upon the throne of Spain. Louis XV. died in 1774, and was succeeded by his grandson, Louis XVI., who met death on the scaffold during the furies of the Revolution in the year 1793. His son was nominally Louis XVII., and after the Napoleonic wars his brother was restored to the throne of France as Louis XVIII. He was succeeded by his brother, Charles X. Charles X.'s grandson was styled the Count of Chambord, and on his death in 1883 the supporters of the B. family in France accepted as the head of the house of B. the Orleanist, Louis Philippe, Count of Paris. He died in 1894, and his position was taken up by his sons. Before this date, however, the Orleanist branch of the B. family had placed one of their number on the throne of France. The Orleanists were descended from the brother of Louis XIV. Amongst the more prominent members of that section of the family may be mentioned the famous, or infamous, Louis Philippe, 'Egalité,' whose son became King of the Fr. for a short time in the 19th century. The two other important branches of the family, as has been already mentioned, are the Spanish and the Neapolitan. The Spanish dynasty was founded practically by Louis XIV., whose scheme for a union between the two countries failed, but who succeeded in placing his grandson, Philip of Anjou, on the throne in the place of the dead Charles II. From this sprang the alliances between France and Spain known as the Family Compacts which influenced for some considerable time the politics of Europe. Philip of Anjou became King Philip V. of Spain, he was succeeded by his son, Ferdinand VI., and he in turn was succeeded by his brother, Charles III. He was succeeded in 1788 by his son, Charles IV., whilst his second son became King of the Two Sicilies. Charles IV. was deposed by Napoleon, this deposition being one of the chief causes of the Peninsular War, but after the wars the throne was restored to the son of Charles IV. in the person of Ferdinand VII. In 1833 he was succeeded by his daughter Isabella, and his brother Carlos, Duke of Madrid, claimed the throne by right of Salic law, and started the series of risings which have, on and off, taken place in Spain since. Isabella abdicated in 1870, and was succeeded by her son, Alfonso XII., who died in 1885, and was succeeded by his posthumous son, Alfonso XIII., who is still on the throne of Spain. The first of the B. family to have the sovereign rights of


Henry IV., 1610
Louis XIII., 1643
Louis XIV., 1715
Louis the Dauphin, 1711
Louis, Duke of Burgundy, 1712
Louis XV., 1774
Louis the Dauphin, 1765
Louis XVI., 1793
Louis XVII., 1795
Louis XVIII., 1821
Charles X., 1836
Louis Antoine, Duc d'Angoulême, 1844
Charles, Duke of Berri, 1820
Henry, Count of Chambord, 1883
Philip V., Duke of Anjou, King of Spain, 1746
Ferdinand VI., 1759
Charles III., 1788
Philip, Duke of Parma, 1765
Parmese Branch
Charles IV., 1819
Ferdinand VII., 1833
Isabella II., 1904
Alfonso XII., 1885
Alfonso XIII.
Ferdinand I., King of the Two Sicilies, 1825
Naples Branch
Philip, Duke of Orleans, 1701
Philip the Regent, 1723
Louis, 1752
Louis Philippe, 1785
Louis Philippe, 'Egalité,' 1793
Louis Philippe, King of the French, 1850
Ferdinand, Duke of Orleans, 1842
Louis Philippe, Count of Paris, 1894
Louis Philippe, Duke of Orleans

the kingdom of Naples was Charles III., who on his succession to the Spanish throne passed these rights on to his second son, Ferdinand I. Ferdinand, at one time deposed by Napoleon, afterwards regained his kingdom and took the title of King of the Two Sicilies. He was succeeded in 1823 by his son, Francis I., who held the same title as his father, and he in turn was succeeded by his son, Ferdinand II. Francis II., who succeeded him, was deprived of his possessions, which were incorporated in United Italy. Another branch of the family is the Parmese branch, which held the titles of Dukes of Lucca and Parma. The duchy of Parma came into the B. family in 1748, when by the treaty of Auchen it was conferred on the youngest son of Philip V. of Spain. It was held by this branch of the family until 1860, when the duchies were annexed by Victor Emmanuel to the kingdom of Italy. Other branches of the B. family are the Vendôme branch, descended from a natural son of Henry IV., and the families of Condé, Conti, Montpensier.

Bourbon, Charles de (1490-1527), usually styled the Constable de B. He was the second son of Gilbert, Count of Montpensier, and was born in Feb. By a fortunate marriage with the heiress of the B. estates, and by the death of his elder brother, he became the wealthiest and most powerful noble in France. His conduct at the battle of Marignano (1515) gained for him the title of Constable of France, and he was also made the governor of Milan. But his great wealth and his vast influence quickly raised him up enemies at court, who, after the death of his wife, seem to have been led by the queen mother. The attacks upon him led to the sequestration of his estates by the king, and B. decided that he would throw his sword into the balance against Francis I. By arrangement with Charles V. and Henry VIII., he agreed to help these monarchs against France, and although Francis I. interviewed him personally he still so distrusted him that he refused to rejoin him, and fled to Italy There he took part in the campaign against France, helping to drive the Fr. out of Italy, but failing in the action before Marseilles. He also took part in the battle of Pavia (1525). The promise made to him by Charles V., who seems to have distrusted him, was broken, but in 1526 he was given the duchy of Milan. In 1527 his troops, composed of Spaniards and Ger. Protestant mercenaries, clamouring for their arrears of pay, were led against Rome. Rome was attacked and stormed, and in the storming of the walls Charles de B. was shot by Benvenuto Cellini; at least, he says so in his *Life*. After the death of B. Rome was sacked by his starving and mutinous troops.

Bourbon Island, *see* RÉUNION.

Bourbon-Lancy, tn. of France, dept. Saône-et-Loire, noted for mineral springs, dating from Roman times; pop. about 2000.

Bourbon l'Archambault, a town of France, in Allier, cap. of the seigniory of B., from the lords of which sprang the royal family. Noted for mineral springs. Pop. 2500.

Bourbonnais, a former prov. of Central France, now corresponding mainly to the depts. Allier, Cher, and Nièvre. It formed the duchy of Bourbon from 1327 to 1523, when it was united to the Crown. In 1661 it was given to the house of Bourbon-Condé, who held it till the Revolution. Its cap. was Moulins. Consult Montégut, *En Bourbonnais et en Forez*, Paris, 1881, and Nicolay, *Déscription et Histoire du Bourbonnais*, 1875.

Bourbonne-les-Bains, a health resort in the dept. of Haute-Marne, France, 20 m. E.N.E. of Langres. Its thermal springs (140-150° F.) were known to the Roms. under the name Aquæ Boivonis. The fine church dates from the 12th century, and there are ruins of the château of the Seigneurs de Bourbonne. Pop. (1901) 4014.

Bourboule, La, a health resort in the dept. of Puy-de-Dôme, France, on the Dordogne, 22 m. S.W. of Clermont. It is noted for its mineral springs. Pop. (1901) com. 1947.

Bourbourg, a tn. of France, dept. of Nord, S.W. of Dunquerque. Vil. and canal of same name. Pop. 2500.

Bourchier, Arthur, an Eng. actor-manager, born 1864 in Berkshire. He was educated at Eton and Oxford, where he founded the O.U.A.D.C., winning distinction in amateur theatricals. His first professional appearance was with Mrs. Langtry in 1889, as 'the melancholy Jaques' in *As You Like It*. Others of his Shakespeare characters are Shylock, Henry VIII., Macbeth, Macduff, Sir Toby Belch, and Falstaff. He toured with Daly's company in America, returning to England in 1893, and married the well-known actress, Miss Violet Vanbrugh, in 1894. He acted with Sir Charles Wyndham as Joseph Surface in *The School for Scandal*. He took part in *Money* with Sir John Hare, under whose management both he and his wife played many important parts. In 1895 he produced his own adaptation of *The Chili Widow*, which proved a great success. For a time he was Sir C. Wyndham's partner at the Criterion, appearing with him in *David Garrick*. In 1904 B. produced *The Arm of the*

Law, adapted from Brieux's *La Robe Rouge*. Both as tragedian and comedian his acting is of the highest merit, and his name usually figures in benefit or gala performances. He has acted in plays by Pinero, Sutro, and Barrie, and also adapted many continental plays for the Eng. stage. As manager of the Garrick B. has produced, among other plays, *The Walls of Jericho, Samson, Glass Houses, The Tenth Man, Find the Woman*, 1912. Of quite recent years he has appeared with his wife at the *Palace Music Hall in sketches such as The Knife* and *A Marriage has been Arranged*.

Bourchier, John, *see* BERNERS, JOHN.

Bourchier, Thomas (*c.* 1404-86), an English archbishop, educated at Oxford. He became Bishop of Worcester in 1434; in 1443 was appointed to the bishopric of Ely; and in 1454 was made Archbishop of Canterbury. He afterwards became a cardinal and Lord Chancellor of England; holding the latter appointment from 1454 to 1456. See *Lives of the Archbishops of Canterbury*, Hook.

Bourdaloue, Louis (1632-1704), born at Bourges, died at Paris. Entered the Society of Jesus when sixteen, and was later appointed professor of rhetoric, philosophy, and moral theology in various Jesuit colleges. He began preaching 1666, and had an immediate and notable success. 1669 he was recalled from the provs. to preach in Paris, where his eloquence soon caused him to be ranked with Racine, Corneille, and other great men of the period. His sermons at Versailles were so much appreciated that he was asked to deliver Advent and Lenten sermons on at least seven other occasions, whereas usually the same preacher never came more than three times to court. When the Edict of Nantes was revoked he went to Languedoc to confirm the new Catholic converts, and performed this mission most tactfully. Towards the close of his life he devoted himself largely to charitable institutions, where his discourses were gladly welcomed. *Voltaire thought his sermons* surpassed Bossuet's; they were certainly easier for the ma understand. B. was a far orator than writer, and pi morality rather than dogma. Père Bretonneau's ed. of his sermons is the reliable one. For his life see Anatole Feugère, *Bourdaloue, sa Prédication et son Temps*, Paris, 1876, or Sainte-Beuve, *Causeries du Lundi*.

Bourdeaux, *see* BORDEAUX.

Bourdon, Sebastien (1616-71), a celebrated French painter, born at Montpellier. He studied at Paris and Rome, and returning to Paris, became one of the founders and later rector of the Royal Academy of Painting. In 1652 he was appointed court painter in Sweden. While generally known for his historical paintings, his other work is of great merit. His masterpiece is the 'Martyrdom of Saint Peter,' in the Louvre, where several of his other works also are hung.

Bourdon de l'Oise, François Louis, a Fr. revolutionist. He was born in the middle of the 18th century at Saint Remy, near *Compiègne*, and became a procurator in the parliament of Paris. He took part in the storming of the Tuileries (1792), and obtained a seat by deception in the Convention. He was instrumental in the execution of Louis XVI., the insurrection of May 31, and the destruction of the *Girondists*. He sided with the Moderates, and helped in the overthrow of the Terrorists (1294). He became a member of the Council of Five Hundred. His Royalist leanings brought him under suspicion, and in 1797 the Directory transported him to Cayenne, where he died soon after.

Bourganeuf, a tn. in France, cap. of an arron. in dept. of Creuse. Castle famous for sheltering Prince Zizim. Pop. 2750.

Bourg-Argental, a French tn., dept. of Loire, 17 m. S.E. of St. Etienne. Manufs. stuffs and silks. Pop. 3250.

Bourg-d'Oisans, tn. of France, dept. Isère, 18 m. S.E. of Grenoble, on the *Romanche. Cold springs and mines* there. Pop. 1500.

Bourgelat, Claude (1712-79), veterinary surgeon, at first a barrister and then a musketeer, founded in 1761 a veterinary school at Lyons, the first of its kind in Europe. He was director also of the second, estab. in 1765 at Alfort. He made a thorough study of the anatomy of domestic animals, and raised an art that had been empirical to the rank of a science. Besides being the author of many excellent technical treatises, he

[illegible] dept. of [illegible]8 m. N.E. of Lyons. The tn. contains the church of Brou (1511-36), founded [illegible] ustria, with her r husband, Philip and her mother-in-law, Margaret of Bourbon. The Gothic church of Notre-Dame dates back to 1505, and has a Renaissance porch. There are manufs. of mineral waters, iron goods, pottery, tallow, and soap, and there is considerable trade in horses, cattle, poultry, and grain. Pop. (1906) com. 20,015.

Bourgeois, Sir Francis (1756-1811), English painter, son of a Swiss

clockmaker. He studied under Loutherbourg, and early won reputation for his landscapes. In 1776 he travelled in France, Italy, Holland, and Poland, becoming painter to the King of Poland. The latter knighted him, as also did George II., to whom he became landscape-painter, 1794. He became R.A. in 1793, and is famous for his bequest of a valuable collection of pictures to Dulwich College, and a large sum of money for the upkeep and extension of the galleries. Two noted works are 'Kemble as Coriolanus' and 'Hunting a Tiger.'

Bourgeois, Léon Victor Auguste (*b.* 1851), a Fr. statesman, was born in Paris, and educated for the law. He held a subordinate office in the dept. of Public Works from 1876 to 1882, was Prefect of Tarn from 1882 to 1885, and after being Prefect of the Haute-Garonne he returned to Paris to the Ministry of the Interior. He was made Prefect of Police in 1887, and in 1888 entered the Chamber as a Radical deputy for Marne. He was Under-Secretary for Home Affairs in 1888, Minister of the Interior in 1889, and Minister of Public Instruction in 1890. In 1895 he himself formed a cabinet, which fell because the Senate refused to vote any supplies, and an appeal to the people bore out its action. He was Minister of Public Instruction in 1898, and in 1903 represented France at the Hague Peace Congress. He became a senator in 1905, and Minister for Foreign Affairs in 1906.

Bourgeoisie, a Fr. word, applied to the middle-class citizens of a tn. as separate from the nobility and the working classes. The term is generally used contemptuously, implying smug respectability. The Fr. bourgeoisie have long been opposed to the aristocratic party, but have themselves been criticised by the socialist and labour classes for their mercenary spirit and narrow outlook.

Bourges, the ancient cap. of Berry, now of Cher, France, 144 m. S. of Paris on the Canal du Berry, situated at the junction of the Yèvre and Auron. It is the seat of an archbishopric, and contains a large military arsenal. The cathedral of St. Etienne, which was begun in the 13th century, is one of the finest churches in Europe. Other notable buildings are the Palais de Justice, formerly the house of Jacques Cœur, Charles VII.'s banished silversmith, and the churches of Notre Dame, St. Pierre, and St. Bonnet. B. was the cap. of the Gallic Bituriges, and was sacked by Julius Cæsar in 52 B.C., when its name was changed to Avaricum. For a time, under Charles VII., it was the cap. of France. Its university, which was frequented by Beza, Calvin, and Amyot, was abolished at the Revolution. The tn. has iron foundries, cloth and cutlery factories, tan-yards, and breweries, and there is extensive trade in wine, grain, hemp, cattle, etc. Pop. (1901) com. 46,551.

Bourget, Le, a vil. of France in the dept. of Seine, 6 m. N.E. of Paris. It was the scene of the defeat of the Fr. army in the Franco-Prussian War, Oct. 30, and Dec. 21, 1870. Pop. (1901) 2,808.

Bourget, Paul Charles Joseph, a Fr. novelist and critic. He was born at Amiens in 1852, and studied at the Lycée at Clermont-Ferrand, and the college of Sainte-Barbe, Paris, where he graduated brilliantly in 1872. In the following year he took up journalism, and contributed articles to the *Nouvelle Revue*, *Revue des Deux Mondes*, the *Renaissance*, and other papers. Three volumes of verse—*La Vie Inquiète*, 1875; *Edel*, 1878; and *Les Aveux*, 1881—were his first contributions to literature. His critical studies, *Essais* and *Essais de Psychologie contemporaine*, pub. in 1883 and 1886 respectively, are singularly subtle in analysis, and are written in a polished, but not very virile style. His first novel, *L'Irréparable*, 1884, was quickly followed by others, *Cruelle Enigme*, 1885; *Un Crime d'Amour*, 1886; *André Cornélis*, 1887; and *Mensonges*, 1887, which placed him in the front rank of modern novelists. They show an extraordinary insight into 'states of soul' and the morbid, cynical interest of a dilettante in psychological situations. He has travelled widely, and is a cosmopolitan by instinct (his father was a Russian, his mother an Englishwoman)—facts which account for his intimate knowledge of mixed society of all nationalities. He has pub. impressions of his travels in *Outre-Mer*, 1895; and *Etudes et Portraits*, 1888. Other publications include: *Le Disciple*, 1889; *Nouveaux Pastels*, 1890; *Sensations d'Italie* 1891; *Psychologie de l'Amour moderne*, 1891; *Un Scrupule*, 1893; *Un Saint*, 1894; *Une Idylle Tragique*, 1896; *Recommencements*, 1897; *Complications Sentimentales*, 1898; *Le Fantôme*, 1901; *Monique*, 1902; *L'Etape*, 1902; *Un Divorce*, 1904; *Les Deux Sœurs*, 1905; *L'Emigré*, 1907; *Le Tribun*, 1911. A collected edition of his works has been pub., and most have been trans. into Eng. He became a member of the Fr. Academy in 1894, and an officer of the Legion of Honour in 1895. Consult Doumic, *Ecrivains d'aujourd'hui*, Paris, 1894; and Lemaître, *Les Contemporains*, vol. iii., Paris, 1886-9.

Bourgogne (Burgundy) was one of the largest and most important of the former provs. of France. It now forms the depts. of Côte-d'Or, Saône-et-Loire, and Yonne, and part of Aur and Aube. It was watered by the Rhone, the Seine, and the Loire, and was one of the most beautiful of the Fr. provs.; it has long been famous for its wines, as could be deduced from the names of some of its tns., Dijon, Macon, Autun, Auxerre, and Beaune. In the middle ages it gave its name to one of the parties in the civil war of 1410-35, the Bourguignons or Burgundians.

Bourgoin, on the Bourbre, in the dept. of Isère, France, 7 m. W. of La-Tour-du-Pin. Pop. (1901) com. 7279.

Bourgoing, Jean François, Baron de (1748-1811), a French diplomat and author, born in Nevers. For seven years from 1777 he held positions at Madrid, first as secretary of the legation, and in 1791 as minister plenipotentiary. He also held several other diplomatic appointments with some distinction. His writings include *Mémoires Historiques et Philosophiques sur Pie VI.*, and books on Spain, notably *Nouveau Voyage en Espagne*, with some translations from the German.

Bourg-St.-Andéol, a Fr. tn. on r. b. of Rhone, dept. Ardèche. Roman church and remains near. Pop. 3300.

Bourg-sur-Mer, a Fr. tn. in Gironde, near R. Dordogne, with remains of anct. fortifications and Roman walls. Pop. 1500.

Bourignon, Antoinette (1616-80), Flemish mystic, born at Lille. She was a religious enthusiast from her earliest years, her marvellous imagination giving rise to strange hallucinations and visions. She strove for reform, and the restoration of the original purity of the Gospel spirit. Her doctrines won for her numerous disciples and as many foes. She was banished from her country, and travelled in Belgium, Holland, and N. Germany. She also visited France, England, and Scotland, and preached reform. Her followers soon dwindled away after her death, but her influence was felt again in Scotland in the 18th century, and was denounced in various Presbyterian general assemblies between 1701-10. Her writings were pub. by Pierre Poiret, her disciple, at Amsterdam, 1679-81. The following works of hers have been trans. into Eng.: *An Abridgement of the Light of the World*, *A Treatise of Solid Virtue*, and *The Restoration of the Gospel Spirit*. A critical account may be found in Hauck's *Realencyklopädie*, or *Etude sur Antoinette Bourignon*, by M. E. S., Paris, 1876.

Bourinot, Sir John George (1837-1902), a Canadian historian, became clerk to the Canadian House of Commons in 1880. His works, which are mostly popular in character, cover the whole field of Canadian history. Apart from his historical books, the best known of his works is *Parliamentary Procedure and Practice in Canada* (1884), which is a standard work on the subject. His other works include: *Canada*, 1885, in the Story of the Nations series; *Builders of Nova Scotia*, *Canada, under British Rule*; *Constitutional History of Canada*, etc. He was made a K.C.M.G. in 1898.

Bourke, a tn. in New South Wales, Australia, situated on the Darling R., 500 m. by rail from Sydney. The district is noted for its abundance of rich copper ore.

Bourke, Richard Southwell, sixth Earl of Mayo (1822-72), British statesman, *b.* at Dublin, and educated there. He travelled in Russia; then entered parliament, 1847, and was Chief Secretary for Ireland, 1852, 1858, 1866. Appointed Viceroy of India, 1869, B. reorganised the finances of the country and promoted many useful public works. He helped to preserve the autonomy of Afghanistan. He was assassinated by a convict at Port Blair, Andaman Islands. *See* Hunter's *Life*, 1876; *The Earl of Mayo* in Rulers of India series, 1891.

Bourmont, Louis Auguste Victor de Ghaisnes, Comte de (1773-1846), a Fr. marshal. He was born at Château de Bourmont, in the dept. of Maine-et-Loire. He fought on the side of the Royalists under Condé; he went into exile from 1793-99, and took an active part in the struggle in La Vendée. He was imprisoned on a charge of intrigue at Besançon, but escaped to Portugal. Later he won the favour of Napoleon, and for his services in Naples, Russia, and Germany (1808-14) was promoted to the rank of general. He vacillated between Louis XVIII. and Napoleon, deserting the latter before the battle of Ligny. In 1829 he was appointed minister of war, and in the following year took command of the expedition to Algeria, in which he was signally successful. He refused to take the oath of allegiance to Louis Philippe, and was in consequence deprived of his peerage and his command in the army. He served Dom Miguel, King of Portugal, for a time, and died at his castle at Bourmont.

Bourne, a market tn. in the Stamford parl. div. of Lincolnshire, 95 m. N. by W. of London. It has an early Eng. church which belonged to a foundation of Augustinian canons of 1138. It has an agric. trade; it is also

famous as having been the stronghold of 'Hereward the Wake.' Pop. 5000.

Bourne, Edward Gaylord (1860-1908), an American historian, born at Strykersville, New York; he graduated brilliantly at Yale (1883), where he subsequently lectured on political science (1886-8) and history (1895-1908). In the intermediate years (1888-95) he was professor of history at Cleveland. Author of *The History of the Surplus Revenue of* 1837, 1885; *Essays in Historical Criticism*, 1901; *Spain in America*, 1904; *Life of J. L. Motley*, 1905. He also translated *The Narrative of De Soto*, 1904, and *The Voyages of Champlain*, 1905.

Bourne, Francis (*b.* 1861), Roman Catholic cardinal, was, after his ordination, priest at Blackheath, Montlake, and W. Grinstead in succession. He was the founder in 1889, and the first head, of a theological seminary in the diocese of Southwark, of which he was made bishop in 1897. He had previously, in 1895, received the appointment of domestic chaplain to the pope. When Cardinal Vaughan died in 1903 he succeeded him as R. C. archbishop of Westminster, and is now head of the Eng. Rom. Catholic Church. Created Cardinal 1911.

Bourne, Hugh (1772-1852), the founder of the sect of Primitive Methodists. He was born at Fordhays in Staffordshire, and began life as a carpenter. He became a Wesleyan Methodist local preacher, but his zeal for open-air meetings did not meet with the approval of that body, and his repeated defiance of the resolutions of the Wesleyan Methodist Conference resulted in his expulsion from the society in 1808. His evangelical style of preaching was extremely popular, however, and he gathered round him many followers, through which he estab. a new denomination, which adopted the name of Primitive Methodist, in 1812. The first chapel was founded at Tunstall in 1811, and the first annual conference at Hull in 1820. He visited Scotland, Ireland, Canada, and the U.S., and before his death the members' roll numbered 110,000. He pub. the *History of the Primitive Methodists*, 1823, and founded *The Primitive Methodist Magazine*, 1824. *See* J. Walford, *Memoirs*, 1855.

Bourne, Vincent (1695-1747), Eng. classical scholar and poet. Went from Westminster to Trinity College, Cambridge, finally becoming a master in his old school. Pub. Lat. poems of real poetic as well as linguistic merit. Many are translations, and often surpass their originals. His pupil, Cowper, ranked him as high as Ovid. Lamb also has praised his Lat. verse. The best edition of his *Poemata* has a memoir by John Mitford.

Bournemouth, a watering-place and winter resort on Poole Bay, off the coast of Hampshire, England, 25 m. S.W. of Southampton. It received its charter of incorporation in 1890, and is included in the parl. bor. of Christchurch. Its sheltered position in a pine valley, and its even temp., has made it a favourite winter resort for invalids. The sanatorium for consumptives was built in 1855, and there are numerous hospitals and convalescent and nursing homes. In the churchyard of St. Peters are buried Godwin, Mary Wollstonecraft, and Mary Shelley. It has a fine stretch of sands, parks, winter gardens, a pier 800 ft. long, and a golf course. Pop. (1901) 47,003.

Bournonite, a mineral composed of lead and copper. It is opaque, of a dull grey colour, with bright metallic lustre. It is first mentioned by Philip Rashleigh in 1797; later, in 1804, by the Comte de Bournon, from whom it derived its name, though Bournon himself named it Endellion, after the place in Cornwall where it was first found. It is also to be found at Neudorf in the Harz, Germany, and a few other localities.

Bournville is the name of an estate in the neighbourhood of Birmingham. It is conveyed to trustees by Mr. George Cadbury, of cocoa and chocolate fame, and is a garden city for the employees of the firm.

Bourrée is a dance of Fr. or Spanish origin, which is very popular in Auvergne and Anjou. Bs. are occasionally written in 2-4, but generally in 3-4 time; as a musical form they are often found in the works of the more anct. composers, such as Bach.

Bourrienne, Louis Antoine Fauvelet de (1769-1834), a Fr. diplomatist; an early friend and secretary of Napoleon I. He was born at Sens and became intimate with Napoleon at the military school at Brienne. He became secretary of the embassy at Stuttgart, 1792; secretary of Napoleon, 1797, whom he accompanied to Italy and Egypt. He was appointed a councillor of state in 1801, but was dismissed from office in the following year on a charge of peculation. In 1804, however, he was sent as chargé d'affaires to Hamburg, but was recalled on account of his dishonest transactions, and was obliged to refund a million francs to the public treasury (1810). He then deserted Napoleon and supported the Bourbons, and sat in the Chamber of Representatives (1815). After the his revolution of 1830, he went out of mind and died in a lunatic asylum at Caen. His *Mémoires sur Napoléon*

(10 vols., Paris, 1829) are unreliable and spiteful.

Bourrit, Marc Théodore (1735-1815), a Swiss artist and naturalist, born at Genoa. He made numerous excursions in the Alps, and devoted all his energies to their study. He was the first to make an attempt to climb Mont Blanc, which he did in 1784, but he did not succeed until three years later, after Balmat and Saussure had done so. His chief works are: *Descriptions des Glacières*, 1774; *Description of the Pennine and Rhætian Alps*, 1781; *Observations made on the Pyrenees*, 1789; and *Description of the Alpine Passes*, 1803.

Bourse, the name applied on the Continent to a stock exchange, money market, or any place where merchants resort. The Royal Exchange of London was originally called Gresham's Burse; it was built by Sir Thomas Gresham (1566-7) on the model of one at Antwerp. The Paris B. was designed by Brongniart (1808) and was completed by Labarre (1827).

Bousca, a Fr. tn. in the arron. of Bordeaux, 2 m. N.W. of that tn. It is practically a suburb of Bourdeaux, and there are many country-houses, and a hydropathic establishment. Pop. 10,000.

Boussa [illegible] Central A[illegible] British Nigeria. It was the scene of Mungo Park's death in 1806. Pop. *c.* 12,000.

Boussac, a tn. of France, cap. of an arron. in dept. of Creuse. Possesses a castle decorated with tapestries said to have adorned Zizim's apartments at Bourganeuf. Pop. 1500.

Boussingault, Jean Baptiste Joseph Dieudonné (1802-87), a Fr. chemist. He studied at the School of Mines of Saint Etienne; served under General Bolivar in the S. American War of Independence; on his return to France became professor of chemistry at Lyons. In 1839 he became a member of the [illegible] professor of agriculture [illegible] des Arts et Mét[illegible] was made gran[illegible] of Honour. He won fame for his experimental investigations in agric. science. Pub. *Economie rurale*, 2 vols., 1844; new ed. in 3 vols., 1860-4 and 1887-91. This work was trans. into English and German.

Boussu, a tn. in the prov. of Hainault, Belgium, on the Haine, 7 m. W. of Mons. In the tn. and neighbourhood are coal mines, smelting works, and copper and iron foundries. Two engagements between the Fr. and the Austrians took place here on April 28, and Nov. 4, 1792. Pop. (1900) 10,900.

Boutell, Charles, British archæologist (1812-77), born in Norfolk. He was rector of Downham Market, 1847-50; and vicar of St. Mary Magdalen, Wiggensball, Norfolk, 1850-5. B. founded the London and Middlesex Archæological Society, 1855. Among other works of the kind he wrote *Monumental Brasses and Slabs of the Middle Ages*, 1847; *A Manual of British Archæology*, 1858; and *Heraldry, Historical and Popular*, 1863.

Bouterwek, Frederick (1765-1828), Ger. poet and philosopher. Began by writing novels and verses, then turned to literary history and philosophy, adopting ideas first of Kant and later of Jacobi. His chief work is *Geschichte der neuern Poesie und Beredsamkeit*, 1801-19. *Aphorismen nach Kant's Lehre vorgelegt*, 1793, and *Ideen zu einer allgemeinen Apodiktik*, 1799, are among his philosophical works.

Bouts, Dirk (*c.* 1410-75), a Dutch landscape and historical painter. Apparently a great deal of uncertainty gathers round his name, which occurs as Theodoricus (Lat.) or Thierry B.; often as Thierry de Haarlem, or Stuerbout, though probably he has no connection with that family of painters. B. settled in Louvain (*c.* 1448), being appointed Portratuerdere to the city (*c.* 1468). Probably a pupil of Hubert van Eyck; his work shows some resemblance to that of Van der Weyden. In 1468 B. finished two large pictures for Louvain Town Hall. These (now in Brussels Gallery) illustrate a legend in Godfrey of Viterbo's chro[illegible] praising the virtue of justice, as [illegible] ment of Oth[illegible] powerful work[illegible] 1468-72 painte[illegible] Other works [illegible] *Erasmus's Ma*[illegible] Church, Louvain; also 'Triptych of the Last Supper' (*c.* 1463). The shutters of this are now at Munich, the wings at Berlin. Many works formerly attributed to Memline are proved to be B.'s ('History of St. Ursula' at Bruges). *See* Crowe and Cavalcaselle, *Early Flemish Painters*, 1872; *Journal des Beaux-Arts*, 1867; MS. of Molanus, *Historiæ Lovaniensium*.

Bouts-rimés, a pastime in vogue among literary circles during the 17th and 18th centuries, particularly in France. One member of the party gives out certain rhyming words, and the rest of the players compose verses, using the given words as their rhyme endings. The amusement was ridiculed by Addison: *see Spectator*, No. 69.

Boutwell, George Sewall (1818-1905), an American lawyer and politician. He was born at Brookline, Massachusetts, was called to the bar in 1862,

and became a leader of the Democratic party in his state. He was chosen to the legislature seven times between 1842 and 1851, and was elected governor for two successive years, 1851-2. In 1854 he joined the Republican party; organised the new dept. of Internal Revenue, 1862; elected to the Congress, 1863; one of those who conducted the impeachment of President Johnson, 1868; Secretary of the Treasury, 1869-73; a senator for Massachusetts, 1873-7. He was secretary of the Massachusetts Board of Education, and in 1900 president of the Anti-Imperialist League. His publications include *Educational Topics and Institutions*, 1859; *Speeches and Papers*, 1867; *The Lawyer, the Statesman, and the Soldier*, 1887; *Reminiscences of Sixty Years in Public Affairs*, 1902.

Bouvardia is the name of a genus of plants which grow in Central and S. America, and belong to the order Rubiaceæ. They are cultivated in England as ornamental greenhouse plants on account of their flowers. Heterostylism prevails in some species.

Bouvines, or **Bovines**, a vil. in the dept. of Nord, France, 6 m. S.E. of Lille. It is noted as the scene of the victory of Philip Augustus of France over Otho IV., Emperor of Germany; John, King of England; and the Count of Flanders, in 1214. Pop. about 600.

Bouxwiller, or **Buxhwiller**, a tn. of Lower Alsace, in the dist. of Saverne. It has brick and tile and chemical works, and manufs. of candles and cotton stuffs. Pop. 4000.

Bouzas, a tn. in Spain, situated in the prov. of Pontevedra.

Bovate, or **Oxgang**, an old Eng. land measure, being the extent of land an ox could plough in a year, which varied from 8 to 24 acres; one-eighth of a carucate, the land ploughed by a team of eight oxen.

Boves, a tn. in Italy situated at the foot of the Alps, about 4 m. from Cuneo. There are marble quarries and iron mines in the district.

Bovey Tracey, an Eng. vil. in Devonshire, 8¼ m. W.N.W. of Teignmouth, with B. Station on the G.W.R. The 'B. Beds' are a deposit of sands, clays, and lignite, due to the degradation of the neighbouring Dartmoor granite. The layer is from 200-300 ft. thick, and extends from B. T. to Newton Abbot. The latest investigations go to prove that the geological formation closely resembles that of the Bournemouth Beds or Lower Bagshot. The clay extracted is very valuable, and largely used for pipe and potter's clay. The lignite or 'B. coal' (worked since 1714) is sometimes burned in the local kilns, but is not economical. *See* Clayden's *The History of Devonshire Scenery*, pp. 159-68. Pop. under 2500.

Bovidæ is a large and well-known family of mammals included in the order Ungulata and of ruminant habit. The family consists of antelopes, sheep, goats, and oxen, with their different species and varieties, but the different sub-families are not sharply defined and easily separated from one another. They occur in all parts of the old world, but are not native to Australia and S. America. They are artiodactylate and all the males have hollow horns; they are frequently present, but sometimes absent, in the females. Their chief distinguishing features are their horns, limbs, stomach, and teeth. About 45 genera and 200 species exist, of which most are antelopes.

Bovill, Sir William (1814-73), an Eng. judge, noted for his decisions in commercial cases. He became barrister 1841, and joined the home circuit. Q.C., 1855; M.P. for Guildford, 1857. The Partnership Law Amendment Act, which he helped to pass, 1865, is always called 'B.'s Act.' B. was Solicitor-General, 1866, and vacated office the same year to become Chief Justice of the Common Pleas.

Bovino, an episcopal city in the prov. of Foggia, S. Italy. It is situated on the Apennines, 2100 ft. above the sea, and 18 m. S.W. of Foggia. It has an anct. cathedral. The trade is principally in wine and oil. Pop. (1901) 7613.

Bovista, a genus of gasteromycetous fungi, or puff-balls, which differ only slightly from Lycoperdon. Many species are found in America, and a few in Britain; several are edible. *B. gigantea*, the bull puff-ball or frog's cheese, has the form of a flattened ball, and is at first perfectly white. Specimens have been gathered which measure 9 ft. in circumference.

Bow, of a ship, is the forepart or stem, which cleaves the water as the vessel moves. A naval architect speaks of the 'U' or 'V' form Bs., referring to the shape of the section, whilst sailors describe various types as being broad or full, and lean or fine Bs. As 'starboard' and 'port' are used respectively of the right and left sides of the vessel, looking forward, it is possible to speak of the starboard and port Bs., which mean, of course, at the stem.

Bow (Fr. *archet*, Ger. *bozen*, It. *arco*) is the name given to the implement by means of which stringed instruments, as the violin, are made give forth their tone. It is made of a thin staff of elastic wood tapering slightly to the lower end, from 29·134 to 29·528 in. in length. It is divided, as a whole, into five parts: the stick, the

ferrule, the nut, the hair, and the head. *The hairs, numbering from 110 to 200 of the best white horsehair, are* fastened to the lower end, and their tension is regulated by the nut.

Bow, *see* ARCHERY.

Bow, a dist. of London, 3 m. E. of St. Paul's in the metropolitan bor. of Poplar, and the parl. bor. of Tower Hamlets (*B. with Bromley returning* one member). It has stations on the N.L.R. and the G.E.R.

Bowden, a small tn. of S. Australia, a suburb of Adelaide; pop. 3000.

Bowdich, Thomas Edward (1791-1824), an Eng. traveller in Africa and scientific writer, born at Bristol. He conducted a mission to Ashanti in

of St. Mary, W. Africa. He wrote sev.

be made *Travels to Gambia, uguese in Angola and Mozambique*, 1824.

Bowditch, Nathaniel (1773-1838), an American mathematician and astronomer of Salem, Massachusetts. From early youth showed a bent for mathematics, but was bred to his father's business as a cooper, and later apprenticed to a ship-chandler. Between 1795-1803 went on five long voyages to perfect himself in practical navigation. Translation of Laplace's *Mécanique Celeste*, 1829-38, with annotations, is one of his chief works. To this (4th ed.) his son's *Life* is prefixed, *1839*. *This was elaborated into* a separate biography by another son, 1865. He also pub. *New American Practical Navigator*, and was offered professorships at various American universities.

Bowdler, Thomas (1754-1825), the editor of the *Family Shakespeare*, in 10 vols., in which 'those words and expressions are omitted which cannot with propriety be read aloud in a family,' 1818. He also purified Gibbon's *History of the Decline and Fall of the Roman Empire* ' with the careful omissions of all passages of an irreligious or immoral tendency.' His prudery ave rise to th

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Franklin he suggested that the phosphorescence of the sea was due to animalcules. It was in recognition of his scientific research that Bowdoin College, Brunswick, Maine, was named after him.

Bowel, *see* INTESTINES.

Bowell, Sir Mackenzie (*b.* 1823), Canadian politician, son of a carpenter at Rickinghall, Suffolk. His parents emigrated in 1833 to Belleville, Canada; here, when he grew up, he became a journalist and newspaper proprietor. In 1867 he entered the Canadian parliament as member for North Hastings; after holding this seat for twenty-five years he passed to the Senate. As a Conservative and leader of the Orangemen he took a prominent part in politics, being successively minister of customs, militia, and commerce, and from Dec. 1894 to April 1896 Premier. His p.
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made K.C.M.G.

Bowen, Charles Synge Christopher (*1835-94*), *Eng. lawyer and judge, born* in Gloucestershire. A great classical scholar, he became fellow of Balliol, 1858, and was called to the bar at Lincoln's Inn, 1861. While studying law he wrote for the *Saturday Review*, and later for the *Spectator*. He appeared in the famous 'Tichborne case,' 1872, and was afterwards appointed junior counsel to the treasury, through the influence of Sir John Coleridge. His health suffered at this time, but as judge of the Queen's Bench, 1879, he had comparative rest. He was raised to the Court of Appeal, 1882; became lord of appeal in ordinary, 1893; and received the title baron. His last public service was presiding over the commission for enquiring into the Featherstone riots. B. wrote *The Alabama Claim and Arbitration considered from a Legal Point of View*, 1868; and *Virgil in English Verse* (*Æneid*, i.-vi., and *Eclogues*), 1887. *See* Stewart Cunningham's *Lord Bowen*, 1896.

Bowen, Francis (1811-90), American writer on philosophy, born at Charleston, Massachusetts, and educated at Harvard. After some years' study in Europe, he returned to Cambridge, Massachusetts, and ed. the *North American Review* from 1843 to 1854. From 1853 to 1889 he was professor of natural religion and moral philosophy at Harvard. His writings include sev. books on philosophy and political economy, and *Gleanings from a Literary Life*.

Bowen, Sir George Ferguson (1821-99), Eng. administrator and colonial *governor, born in Ireland*, and educated at Oxford. He served as president of the University of Corfu, then became chief secretary of gov. in the Ionian Islands, 1854-9. Between 1859

and 1887 was successively governor of Queensland, New Zealand (put an end to Maori War), Victoria, Mauritius, and Hong Kong. He was knighted in 1856; 1888 was royal commissioner to Malta in connection with the new constitution granted to that is. B. wrote *Ithaca in* 1850 (identifying it with Homer's): *Mount Athos, Thessaly, and Epirus*, 1852; *Imperial Federation*, 1886; Murray's *Handbook for Travellers in Greece* (7th ed. 1900); and *Thirty Years of Colonial Government*, 1889.

Bowen, Richard (1761-97), a naval officer, born at Ilfracombe. In April 1782 he was serving on the *Foudroyant* when she captured the *Pegase* off Ushant, and in 1794 took part in the attack on Martinique. He soon after received his appointment as commander, and in the same year became captain of the *Terpsichore*, 32-gun frigate, which he commanded till his death. After further operations in the West Indies he returned to Europe, and in Oct. 1796, off Carthagena, captured the Spanish frigate *Mahonesa*, which was much stronger than his own vessel, having 275 men to B.'s 182. The *Terpsichore* was greatly damaged, but by Dec. she was off Cadiz, where she encountered the French 36-gun frigate *Vestale*. Here again B. had 166 men to his opponent's 270, but again he won, though unfortunately owing to a gale he was not able to secure his prize. After the battle of St. Vincent, March 1797, B. fell in with the Spanish flagship *Santissima Trinidad* (130 guns) in a damaged condition, and fought her till twelve other Spanish ships appeared, when he escaped. His eventful career ended during Nelson's unlucky attack on Santa Cruz, July 1897, when B. was shot dead.

Bower, Archibald (1686-1766), a Scottish eccles. historian, educated at Douay and Rome. He joined the Jesuit Order, 1706. B. was a member of the Court of the Inquisition in Macerata, 1723-6. He then returned to England and became Protestant; 1745 he rejoined the Jesuits, but professed to have left the Church of Rome two years later. For these constant changes of religion he was severely attacked. He ed. *Universal History*, 1735-44; and wrote *History of the Popes*, 1748-66.

Bower, or Bowmaker, Walter (1385-1449), the 'continuator of Fordun,' abbot of the monastery of Saint Columba, in the is. of Inchcolm, Firth of Forth. When John Fordun died, he had written his *Scotichronicon* to the death of David I., 1153, in five books. B. added eleven books, continuing the history to the death of James I., 1437. Walter Goodall pub. an edition in Edinburgh in 1759. The work is written in Latin, and no complete translation has yet appeared. There is a manuscript in the British Museum —known as the *Black Book of Paisley* —and an abridged manuscript—*The Book of Cupar*—in the Advocates' Library, Edinburgh.

Bowerbank, James Scott (1797-1877), Eng. geologist, born in London. Succeeded with a brother to his father's distillery. Always interested in botany, astronomy, and natural history, he worked enthusiastically at the microscope, and formed a large collection of fossils. He founded with others 'The London Clay Club,' 1836; pub. *History of the Fossil Fruits of London Clay*, 1840. Became F.R.S., 1842; part founder of Palæontographical Society, 1847. B. was much interested in the study of sponges, and on retirement from active life wrote *A Monograpy of the British Spongiadæ* (Ray Society, 1864-82). The British Museum bought his fine collection, 1864.

Bowerbankia is a low form of life, belonging to the family Vesiculariidæ of the Polyzoa, and named after Bowerbank, the geologist. *B. imbricata* is common to the S. coasts of England.

Bower-bird is the name applied to many species of the family Paradiseidæ, birds of paradise, which have a curious habit of building *runs* or *playing-houses* for their amusement. They are all found in Australia, and it seems likely that only the males construct these bowers. They are made of sticks and grass and are ornamented with bright feathers, flowers, shells, and any gaily-coloured objects they can find. Other species construct their bowers between trees and decorate them with ferns an moss. *Sericulus melinus*, the regent-bird, *Chlamydodera maculata*, the spotted B., and *Ptilonorhynchus holosericeus*, the satin B., are common species, while other genera are *Amblyornis* and *Prionodura*. *See* J. Gould's *Birds of Australia*, 1848-69.

Bowie-knife, an American hunting-knife, called after Colonel James Bowie (c. 1790-1836), who in a skirmish near Natchez, 1827, killed an opponent with a blacksmith's file; this file he afterwards fashioned into a double-edged blade, about a foot long and more than an inch wide.

Bow Island, called also Harp Is. and Hao, is one of the group of is. in the Tuamotu Archipelago of Polynesia (Pacific Ocean), and is so named on account of its being bow-shaped. Lat. N.E. point, 18° 6′ S.; long. 140° 51′ W.

Bow-legs (*Genu varum*), a deformity

marked by separation of the knees when the ankles are touching. There is usually outward curvature of both femur and tibia. It may occur in one leg only, but is generally found in both. At birth all infants are bandy-legged, but during their first year a gradual change comes, the cartilage hardening to bone. In normal cases the lower limbs thus get prepared to support the body. Any attempt to walk too early must cause arrest in development of the limbs or an increase of the bandy condition. If a child is rachitic or weakly in any way this condition may be almost permanent. The chief cause is rickets, which makes the legs unable to support the weight of the body. Other causes are occupations of certain kinds (such as that of jockey or postillion), followed before the bones have grown and hardened properly: traumatism, etc. Any active, heavy child may become bow-legged if allowed to be too much on its feet. Treatment must largely depend on the cause of deformity and the patient's age. In young children treatment of the constitutional disease will usually effect a cure: in older patients an operation is needed. In a case caused by rickets diet and general hygiene are of the utmost importance. Rest on the back and massage are advantageous. The legs sometimes have to be bandaged together or to iron splints. This deformity is the very opposite to that known as knock knee (*Genu valgum*), which is, however, still commoner.

Bowles, Thomas Gibson (*b.* 1844), politician and author, was educated at King's College, London. From 1860 to 1868 he was in the Inland Revenue dept., which he left to take up journalism. He was the founder of *Vanity Fair*, which he afterwards sold. He was war correspondent for the *Morning Post* during the Franco-German struggle of 1870-71, and witnessed the Balkan campaign of 1878. Elected as a Conservative for King's Lynn in 1892, he held that seat until 1906. In the same year he contested the City of London, but was defeated by Mr. Balfour. In Jan. 1910 he was again elected at King's Lynn, standing this time as a Liberal, but was rejected in the following Dec. Mr. B. was always noted in the House for his fearless independence, refusing to be bound by merely party considerations, and was often a 'fair trial' to his own side as well as his opponents, with his political sympathisers by appearing in person in the High Court and successfully arguing on constitutional grounds that the Bank of England was not entitled to deduct income-tax from dividends on stock on a mere resolution of the Committee for Ways and Means of the House of Commons and before the tax had actually been imposed by statute. His chief writings are: *The Defence of Paris*, 1871; *Maritime Warfare*, 1878; *Flotsam and Jetsam*, 1882; *Log of the Nereid*, 1889; *Declaration of Paris of 1856*, 1900; and *Sea Law and Sea Power*, 1910.

Bowles, William Lisle (1762-1850), an Eng. poet. He was born at King's Sutton, Northamptonshire, and educated at Winchester School and at Trinity College, Oxford. He became rector of Bremhill, Wiltshire, and prebendary of Salisbury Cathedral. In 1789 he pub. *Fourteen Sonnets on Picturesque Spots*. The graceful melody of his verse, his fresh interest in country scenes, and his tenderness of feeling, were in striking contrast to anything that had appeared in recent 'classical' poetry, and he was enthusiastically hailed by his young contemporaries, Wordsworth, Coleridge, and Southey. His longer poems, *The Spirit of Discovery*, 1801; *The Missionary of the Andes*, 1815; *The Grave of the Last Saxon*, 1822, etc., have not the merit of his sonnets. In 1807 he pub. his *Life of Pope*, with a memoir and critical notes, which gave rise to the famous 'Pope and Bowles' controversy. B. upheld that images borrowed from nature are more poetical than those from art, and that passions depicted in poetry should be elemental and therefore universal, and not those of transient fashions. Bowles' chief opponents were Byron, Campbell, and Roscoe, but he was supported by Hazlitt and the *Blackwood*. See Gilfillan's ed. of his works, with memoir, 1855.

Bowling, or the game of bowls, is an anct. and historic pastime introduced into England soon after the Norman conquest. The earliest mention of the game in writing is that of William Fitzstephen in the 12th century, who described a game similar to the modern one as having been played by the youth of London, while the earliest pictorial record is contained in an old 13th century MS. in the British Museum. In the 15th and 16th centuries the game was played in alleys, but the more popular form of the game that has survived is the one played in the open-air on greens. At one time the game was forbidden by parliament, as it was thought to interfere with the practice of archery, but later on this law was repealed. The game has been much with royalty

and the gentry of England in past days; Henry VIII. used to play it at Hampton Court, and Charles I. was also a keen bowler, and of course there is the well-known story of Sir Francis Drake, who was playing it when news was brought to him that the Spanish Armada was in sight, and he waited to finish the game before he went out and defeated the enemy. In the 18th century the B. green was a very favourite resort for men of fashion, while at the present day B. greens and clubs are to be found all over England and Scotland. The game is played on what are known as B. greens, specially laid plots of grass from 40 to 60 yds. square, and usually sunk below the level of the land immed[illegible]. The players are [illegible] and each has tw[illegible] the 'jack' is thrown up to one end of the green, the object of the game being for the players to roll their balls as near as they can to it. The jack is a small white ball, about 4 in. in diameter, sometimes of ivory, but more usually of painted wood. The bowls themselves are made of very hard wood, highly polished, and are from 6 to 7 in. in diameter, and thus are much larger and heavier than the jack. They vary in size and weight, the maximum size is 16½ in. in circumference and about 3 lbs. in weight, but there is no minimum as regards size. They are made with a 'bias,' that is, with one side round and the [illegible] tendency [illegible] line when [illegible] ourse, the players have to allow in rolling them. This is one of the most skilful parts of the game, as a good man can make his bowl avoid others that may be in his way in order to get his bowl near the jack. When all the players have finished their turns from one end, the distances from the jack of each bowl are measured, and a point is counted for each one nearer the jack than the nearest one on the opposing side. The jack is then thrown to the other end of the green, and the turns are taken again, and so on till the number settled upon to play to is reached. One member of a side is always known as the 'skip,' and he acts as captain and directs the play of the others if necessary; he generally throws the jack and takes the first shot at it. The game has variations all over England, especially in the N., where it is played more after the Scotch style, although the latter game differs a good deal from the Eng. style. In Scotland it is very popular, although, curiously enough, the old law that rendered it illegal was repealed as late as 1845, though it was played long before this nominal embargo was removed. Curling is a game almost exclusively played in Scotland or by Scots, and is very similar to bowls, except that it is played on the ice with flattened bowls made of stone with wooden handles. B. clubs in Scotland are far more numerous than in England, though the number in this country is increasing, especially round London, where there are already between forty and fifty. A great many of the public parks and commons now have greens where the public can play free of charge, providing, of course, their own bowls and jack. The game is played in America with ten pins instead of a jack, and is really no more than an elaborated form of our pastime known as skittles or nine-pins. It is played indoors in a B. alley, and such places are becoming more common in this country. It is really a revival of an old Dutch game called long B., which was popular in England during the 18th century.

Bowling Green: 1. The county-seat of Warren Co., Kentucky, on the Barren R., and on the Louisville and Nashville Railroad. It contains many educational institutions, including Ogden College, 1877; Potter College for Women, 1889; and the Southern Normal School and Business College. It was incorporated in 1812, and received a charter in 1893. There is considerable trade in all kinds of agric. produce, and also in horses and cattle. During the Civil War it was an important strategic point. Pop. (1900) 8226. 2. The county-seat of Wood Co., Ohio, on the Cincinnati, Hamilton and Dayton, and the Toledo and Ohio Central Railroads. There are foundries, canneries, cut-glass works, etc. Oil and natural gas is found, and it is an agric. dist. Pop. (1900) 5067.

Bowman, Sir William (1816-92), an eminent oculist, born at Nantwich. He was professor of physiology at King's College, London, 1845-55; Fellow of the Royal Society, 1841; and of the Royal College of Surgeons, 1844; the first president of the Ophthalmological Society, 1880-3. He won a great reputation by his *Lectures on Operations on the Eye*, 1849. He pub., in conjunction with Todd, *The Anatomy and Physiology of Man*, 1843-56, and his *Collected Papers* were edited by Sanderson and Hulke, with a *Life* by H. Power, 1892.

Bowness, a tn. on the E. shore of Lake Windermere, Westmorland, [illegible] m. N.W. of Kendal. Pop. 2662.

Bowring, Sir John (1792-1872), an Eng. statesman, traveller, and linguist, born at Exeter. He began life in a merchant's office, but devoted much of his time to languages, for which he

had a remarkable talent. In after life he boasted that he had a knowledge of 200 languages, and could speak 100 of them. He became the first editor of the *Westminster Review*, 1824, and trans. much foreign poetry, both anct. and modern, into Eng. In 1831 he was sent by the British gov. to inquire into and report on the financial [illegible] visited the [illegible], and Parl., 1835-7 and 1841-9, and an active free-trader; British consul at Hong Kong, and superintendent of trade in China, 1849-53; knighted, 1854; governor of Hong Kong, 1855. *In 1856, the Arrow*, bearing the British flag, was fired upon, and B., to avenge the insult, bombarded Canton without consulting the home gov. His action was very severely criticised, and a vote of censure was moved against him in parl. He retired on a pension in 1859, and died at Claremont. He wrote, [illegible] *Sketch of Holland*, *People of Philippine* [illegible] *hical Reminiscences*, 1877, and numerous other works.

Bowsprit is the boom or spar projecting from the bows of a sailing ship and also of a steamer, when its stem is of the cut-water type. It supports the jib-boom. An elongation of the spar is used to fix the foremast stay-ropes, which carry the sails.

Bowstring Hemp is a fibre obtained from various species of *Sansevieria*, tropical plants which are allied to the ophiopogon in the monocotyledonous order *Liliaceæ*. The fibre is used in making strings for bows. *S. Zeylanica* is the E. Indian B. H.; *S. guineensis* comes from Africa; and *S. fasciata* is the banded bowstring hemp.

Bow Window, *see* Bay Window.

Bowyer, Sir George (1811-83), an Eng. jurist. He was *b.* at Radley, near Oxford, and was called to the bar in 1839; reader in law at Middle Temple, 1850; entered parl. and was elected member for *Dundalk, 1852-68*; and for Wexford Co., 1874-80; and left the Liberal party on account of his Home Rule principles. He was converted to Rom. Catholicism in 1850, and wrote on controversial subjects. His works on constitutional jurisprudence include, *Commentaries on the Constitutional Law of England*, 1841; and *Commentaries on Modern Civil Law*, 1848.

Bowyer, William (1699-1777), a printer, was educated at St. John's College, Cambridge. In 1722 he became his father's partner in business, and in 1767 his firm was chosen printers to the two Houses of Parliament. His most important work was a Gk. N.T., and he also wrote two essays upon the *Origin of Printing*, which were pub. in 1774. He trans. Rousseau's *Discourse* in 1751. He bequeathed in his will a large sum of money to the Stationers' Company, to be used for decayed printers and compositors.

Box, or *Buxus*, is the generic name of several species of the widely-distributed order Buxaceæ. It is of great commercial value, as it is used in wood-engraving, in turning, and in the manufacture of musical and mathematical instruments. The flowers grow in heads, one female being surrounded by many male flowers, and the fruit is explosive. The most common species in our gardens is *B. sempervirens*, of which the variety *B. suffruticosa* is used very frequently as an ornamental edging. *B. balearica*, the Minorca or Balearic box, is common to Turkey and the islands of the Mediterranean; it grows to a greater height than *B. sempervirens*, the wood is inferior and of a bright yellow colour. *B. japonica* is a smallish shrub common to Britain, and *B. microphylla* is noted for its small leaves.

Boxall, Sir William, Eng. painter (1800-79), born at Oxford. He studied at the Royal Academy and in Italy. He exhibited his 'Jupiter and Latona' at the Academy in 1823; 'The Contention of Michael and Satan for the body of Moses,' 1824; 'Milton's Reconciliation with his Wife,' 1829; 'Lear and Cordelia' [illegible] and 'Hope,' 1838. B. also [illegible] for the Waverley Rooms, 1833, and afterwards devoted himself almost entirely to portrait-painting. He painted the Prince Consort, wearing his robes as master, for Trinity House. He became R.A., 1863, and Director of the National Gallery on Eastlake's death, 1865, but retired, 1874, owing to ill-health. He was knighted by the queen at Windsor in 1871. B. was also an honorary member of the Academy of San Fernando at Madrid.

Box Days, certain days in the spring and autumn vacation and Christmas recess, fixed by the Court of Session in Scotland, on which certain legal business, such as the lodging of pleadings, defences, and other law papers, may be performed to expedite proceedings in ordinary term time. The name is derived from the boxes in which the papers are placed.

Boxers, The. This name was given by Europeans to the members of one of China's numerous secret societies. This particular association, partly religious, partly political, was organised

in 1896 by the prefect of Shantung. Its members were all strongly opposed to foreign influence, and their hostility was to a certain extent aggravated by demands of the Western powers for land and privileges in China. This, together with severe drought and famine, and troubles at court, urged them on to terrible excesses. Murder of a missionary met with but slight punishment; hence they organised an anti-missionary rising, 1900, and determined to destroy all foreigners in their country. They marched through China pillaging, destroying railways, and murdering missionaries and native Christians. The dowager-empress soon gave support to the movement, the imperial troops making no attempt to crush the rising. At Pekin the B. murdered the Chancellor of the Japanese legation and the Ger. minister, Baron von Ketteler, and then besieged the legations. This intolerant behaviour gave rise to an intervention of all the European powers. Americans and Japanese also joined the allies for the purpose of suppressing the B. Hard fighting took place at Tien-tsin and elsewhere, but finally the relief party succeeded in freeing the besieged, August 1900. The court fled, and the allies were left in possession of Pekin until a peace was signed in Sept. 1901, by which China was obliged to pay a large indemnity to the foreign powers concerned. Consult for fuller details *China under the Empress-Dowager*, by Bland and Backhouse, 1910.

Box-hauling (navigation), a manœuvre practised when a ship being close hauled refuses to tack, and there is not room to wear. The head-sails are thrown aback to give her stern-way, the helm is then put alee, and she falls off, after which she is rounded to, and her proper course resumed.

Boxing is the method of fighting with the fists either with or without gloves, though the latter method is not in vogue to-day, but at one time it was very common, and perhaps should really come under the heading of pugilism. In anct. times B. was practised at the Gk. games and the Rom. gladiatorial spectacles. Among both the Gks. and Roms., however, the naked fist was not used, but a kind of glove known as the cestus, made of leather and sometimes loaded with iron or lead. It was a terrible weapon, and these fights frequently proved fatal. It is in England, however, that the 'noble art,' as it is sometimes called, attained a high state of proficiency. It first came into public notice in this country in the early part of the 18th century. James Figg opened the first B. booth in London in 1719, and it continued to increase in popularity all through the reigns of the four Georges. Jack Broughton was the first man to think of using gloves for B., they were known as mufflers, and the same boxer also drew up the first set of rules. After Broughton's death the public interest in the ring flagged a little, but a boxer named Tom Johnson stepped into the breech, and the waning interest was rekindled till the flame burned more brightly than ever. From 1750 up to about 1820 the interest in the ring was enormous, all classes of society, high and low, took a part, as any one who has read the fascinating pages of *Rodney Stone* will know. Lord Byron has related in his diary how he had lessons in B. from the famous 'Gentleman' Jackson, who made a fortune out of pugilism. Mendoza the Jew, Jem Belcher, Humphreys, Tom Cribb, Spring, and Dutch Sam, were all famous fighters of their day. Gulley was a pugilist who afterwards entered parliament, and more extraordinary still was the case of Bendigo, who became a revivalist preacher, and of whom the story is told that he once used threats of a pugilistic nature to induce his congregation to give liberally to the collection. Since about 1820 the ring has been shorn of much of its glory, and the days of the 'Corinthians,' the rich patrons of the ring, are now over. From 1850-60 public interest was re-aroused by the B. of such men as Sayers and Heenan, Broome and Mullins, but it has never regained the tremendous hold it once had on the people. Other sports have become more popular, and these being of a better class, the crowd that follows the prize ring is not always a desirable one, although, of course, many gentlemen still take an interest in B. The Amateur Boxing Association is the governing body for the better class sportsmen who now patronise this sport, and the Belsize Boxing Club is by far the best in London. Among boxers of recent times may be mentioned Jem Corbett, J. L. Sullivan, Jeffries, Fitzsimmons, Tom Sharkey, Gunner Moir, and Bombardier Wells of the white men, and Peter Jackson, Sam Langford, and Jack Johnson of the negroes. The latter is the present champion of the world, since his defeat of Jeffreys. His proposed fight with Bombardier Wells was stopped by the authorities beforehand. The present rules for boxing are those drawn up in 1867 by the Marquis of Queensberry, and all contests now are held under what are known as 'the Queensberry Rules.' The ring is roped in, and usually 24 ft. square. The men wear light boots or shoes, with

shorts and vests. Each round lasts three minutes, with one minute's rest between each for short contests, but for long ones it is sometimes longer. The men either fight a certain number of rounds and score by points, when the last round is four minutes or the fight is to a finish, that is, until one man is 'knocked out.' If a man cannot come up when time is called for a new round, or cannot resume when knocked down before ten seconds, he is 'counted out,' and loses the contest. The referee is the one to decide all points, though sometimes he is assisted by two judges, though he always has the option of the casting vote, should the judges disagree. Each competitor is allowed a second and one attendant, but no coaching or advice is allowed to be given to the combatant during the progress of a round, and any boxer who may fight unfairly, by hitting below the belt, hitting with the open glove, holding the ropes or wrestling, may be disqualified by the referee, who has power to stop the fight at any time, or even if one man is getting too severely punished he can declare the contest over. The prin. weights are bantam weight, light weight, middle weight, heavy weight, and welter—or any—weight; and perhaps a brief explanation of some of the more general terms used in B. may be useful. 'Time' has already been described, and it is also used of a blow—one delivered at the most advantageous moment. The 'upper cut' is a blow given with either the right or left hand on the face of an opponent when he is leaning forward to deliver a blow at you. A 'cross counter' is to hit your opponent with one hand at the moment he is trying to hit you with the other, and this by a little skilful dodging can be made a very effective blow indeed. 'Hitting below the belt' is illegal; a blow must be either on the upper part of the body or the head, the arms, of course, can be hit in whatever position they may happen to be. 'Out-fighting' is to keep at more than arm's length of your adversary, and 'in-fighting' is to keep the contest within that distance. To 'break ground' is to move swiftly to one side when your rival opens his attack, which puts him off and leaves a good opening for your own attack. To 'break away' is a command of the referee when the men are apt to clinch or get too close. A 'duck' is to lower your head just as your opponent leads off at it, and so avoid his blow, while to 'draw back' is to get your head and body out of his reach without moving your feet. A 'counter hit' is not unlike the cross counter, it should be so timed as to touch your man at the very moment he is reaching forward to hit you, and properly carried out this is a very telling blow. A 'side step' is the act of bending down and changing the feet to the right or left very quickly as your opponent attacks. To 'head off' is to start the attack: the right hand is usually held across the breast and the left used to lead off with. A 'quick return' is most effective, and this must be done the moment you have been hit. A 'sharp rally' is a rapid exchange of blows without pause or draw back on either side. To 'parry' is to guard or ward off a blow with the arm; and finally, a 'knock out blow' is one which finishes the fight if it keeps your opponent on the ground while ten seconds are counted. For those who would study the book-lore of this art closer we can recommend *Boxing*, in the Badminton Library, and Johnstone's *Modern Glove Fighting*, while an interesting old book on the subject is *Boxiana, or Sketches of Ancient and Modern Glove Fighting*, by Pierce Egan, published in 1824. Those who would read an expression of continental opinion will find an intensely dramatic B. scene, reflecting adversely on the 'noble art,' in Victor Hugo's novel *By the King's Command*.

Boxing-Day, one of the Eng. bank holidays (Dec. 26). On this day the annual presents or Christmas boxes were usually made to employees.

Boxtel, a tn. near Bois-le-Duc, Holland, where the Fr. defeated the Eng. and Dutch allies, 1691. Here Wellington, then Colonel Wellesley, witnessed his first battle and distinguished himself in covering the retreat.

Box-thorn, or *Lycium*, is a genus of Solanaceæ found in Europe and America, consisting of thorny shrubs and trees. *L. europæum* grows in Europe, *L. fuchsioides* in S. America, and *L. vulgare* in N. America.

Boyaca, a tn. in the dept. of Boyaca, Columbia. Here Bolivar defeated the Spaniards in 1819. Pop. 7000.

Boyar, or **Boyard**, an anct. order of Russian nobility. In early times the Bs. formed the council of the prince, and the title was only partly hereditary. Some of them were chosen from the prince's personal attendants and trusted warriors, others probably from leading men among the people. As time went on the military and civil Bs. drew apart, and the former, as in France, became the 'noblesse d'epée,' and were termed courtiers, while the latter devoted themselves more to commerce. Peter the Great first regularised Boyardom on its present footing.

Boyaux are winding trenches form-

ing a means of communication between siege works or with the magazine.

Boy-bishop. In mediæval times, on the feast of St. Nicholas, Dec. 6, a choir-boy in each cathedral was elected by his fellows to act as bishop till Innocents' Day, Dec. 28, and during this period a number of burlesque ceremonies took place, with the full approval of eccles. and royal authorities. These buffooneries ended in England at the Reformation, but the Eton '*Montem*' (*which used to* be held in winter) is said to be descended from them.

Boyce, Samuel (*d.* 1775), English poet and dramatist. Originally an engraver, and later in the South Sea House. His works include *The Rover, or Happiness at Last*, a pastoral drama which was never acted, 1752; *An Ode to the Right Hon. the Marquis of Harlington, Lord Lieutenant of Ireland*, 1755; *Paris, or the Force of Beauty*, 1755; *Poems on Several Occasions*, a large paper copy of which was in the Garrick sale, 1757; *Specimens of Elegiac Poetry*, 1773; and a prose work, *A New Pantheon, or Fabulous History of the Heathen Gods, Heroes, Goddesses, etc.*, explained in a manner entirely new, and adorned with figures depicted from ancient paintings. To which is added a *Discourse on the Theology of the Ancients*, and an appendix, *The Thanksgiving Hymn of Adam*.

Boyce, William (1710-79), an Eng. organist and composer, born in London and educated at St. Paul's School, being a chorister in the cathedral, and later an apprentice to Dr. Maurice Greene. In 1734 he became organist at Oxford Chapel (St. Peter's), Vere Street, and in 1736 at St. Michael's, Cornhill, becoming in the same year composer to the Chapel Royal. In 1737 he was appointed conductor of the Three Choirs Festival, and in 1749 became organist at All Hallows, Thames Street, and in 1758 organist to the Chapel Royal. He composed numerous orchestral settings, operetta, etc., but is best known by his ed. of *Cathedral Music*, 1860.

Boycott, Charles Cunningham (1832-97), English land agent, educated at Blackheath and Woolwich. In 1850 entered the army; retired some years later as captain; 1873 agent for Lord Erne's estates in co. Mayo, coming into conflict, 1879, with the Land League agitators. They, under Parnell, began to persecute B., 1880; men refused to work for him, and he had to be placed under police protection. Hence the modern phrase 'to boycott a person' is derived. B. left Ireland for London and U.S.A., but returning in the autumn of 1881, was again mobbed and ill-treated. After this, conditions gradually improved; 1886 he became agent of Adair's estates in Suffolk; 1888 he gave evidence before the commission appointed to examine charges made by the *Times* against the Irish leaders. *See* Barry O'Brien's *Parnell*, i.; *Times*, June 22-4, 1897; [illegible] *Lord Erne and* 1880; Murray's *ee* BOYCOTTING. of coercion consisting in a conspiracy to prevent all *dealings, social, commercial*, or otherwise, with the person aimed at, and the conspirators back up their orders by force. It derived its name from being first used against Captain C. C. Boycott, Mayo, Ireland, in 1880 (*q.v.*). This form of persecution was stringently dealt with under the Crimes Act of 1887, but is not yet extinct in Ireland. B. became more and more a form of international warfare. In 1912 the Turks declared a national boycott against everything Italian. Before that, in 1910, all Greek goods were rigorously boycotted. The *Shawdeshi* movement in Bengal, India, was the boycott by natives of British-made wares as a protest against the partition of that province. American trade-unions adopted this method of treating employers with whom they quarrelled.

Boyd, Andrew Kennedy Hutchison (1825-99), a Scottish divine and author, widely known as A.K.H.B., was born at Auchinleck, Ayrshire, and studied at King's College, London, and the Middle Temple; then returning to Scotland, he entered Glasgow University and became a minister of the Kirk, taking charge successively at Newton on Ayr, 1851-4; Kirkpatrick Irongray, Dumfries, 1854-9; St. Bernard's, Edinburgh, 1859-65; and St. Andrew's, 1865-99. In 1890 he was elected moderator of the *general assembly*. As an author he won fame by his *Recreations of a Country Parson*, first contributed to *Fraser's Magazine*, an attractive series of articles 'concerning' things in general, followed by his *Graver Thoughts and Critical Essays of a Country Parson* (1862-75), and three vols. connected with life at St. Andrews. His books have exactly the charm of a lively and genial conversation.

Boyd, Mark Alexander, Scotch author (1563-1601), born in Galloway. After a wild and unruly youth he left Glasgow College for the Continent, 1581. He studied law at Paris, Orleans, and Bourges under Jacques Cujas, whose friendship he won by some verses in the style of Ennius. In 1587 he served with Catholics in the League War for Henri III., but

resumed his studies at Toulouse, 1588. Thence, as suspect, he escaped with difficulty during the Catholic insurrection to Bordeaux; 1592 he pub. at Antwerp Latin poems dedicated to James VI.; 1595 he returned to Scotland, and was for a time travelling tutor to the Earl of Cassillis. He died and was buried in Ayrshire. His *Epistolæ Heroides et Hymni* are to be found in Johnston's *Deliciæ Poetarum Scotorum*, 1637. Among his prose and verse manuscripts (Advocates' Library, Edinburgh), are *In Institutiones Imperatoris Commenta* and *L'Estat du Royaume d'Escosse à Présent*. *See* Sibbald's *Scotia Illustrata*, 1683; Dalrymple's *Sketch of the Life of Boyd*, 1787; Irving's *Lives of Scottish Writers* (i.), 1839.

Boyd, Robert (*d.* 1590), fourth Lord Boyd, Scotch statesman. Helped the regent Arran in suppressing Lennox's rebellion, 1544; warred against the queen-regent with the lords of the congregation, 1559; signed the treaty of Berwick, joining English army at Prestonpans, 1560. B. subscribed to *Book of Discipline of the Kirk*, 1561. According to some accounts he was privy to the murder of Darnley; 1567 member of the packed jury acquitting Bothwell of the deed; but joined a band of nobles to protect the young prince from his supposed designs. Later he took Bothwell's part again. Permanent member of privy council, 1567; fought for Mary Queen of Scots on various occasions (Langside battle), 1568; member of Mary's council, 1569; employed by her on various missions, one being to obtain her divorce from Bothwell. He was suspected of complicity in the murder of Murray, 1570; joined regent's party, becoming privy councillor, and Morton's firm adherent after 1573 (appointed extraordinary lord of session). B. was a party to the 'raid of Ruthven,' and was banished for this, 1583; 1586 acted in negotiations for alliance between England and Scotland, and was restored to the bench. Warden of the marches, 1587; commissioner to enforce the statute against Jesuits (1587) in 1589. *See* Keith's *History of Scotland;* Froude's *History*, vii.; Herries's *Memoirs; Lettres de Marie Stuart* (edited by Labanoff).

Boyd, Zachary (1585–1653), a Scottish divine, was educated at the universities of Glasgow and St. Andrews, afterwards becoming first student and then teacher, under his cousin Robert B., at the Protestant College of Saumur, France. When that town was treacherously occupied by Louis XIII. in 1621, and the Huguenots were everywhere persecuted, Zachary B. returned to Scotland, and became minister of the Barony parish, Glasgow, which then held its services in the crypts beneath the cathedral. In 1634-35 and 1645 he was rector of the university. He was a noted preacher and a staunch Covenanter. On Oct. 13, 1650, a month after the battle of Dunbar, he had the courage to 'deal faithfully,' as the phrase went, with Cromwell, who was present, in a sermon at Glasgow Cathedral, but though political opponents, the two men respected each other in private life. B. wrote many books, the best known being *The Last Battell of the Soul in Death*, 1629, edited by Gabriel Neil in 1831, and some books of verse, *Psalms of David in Meeter* and *Zion's Flowers*, the latter being metrical versions of Scripture, often known as 'Boyd's Bible.' His writings were marked by the quaint 'conceits' common in those times, but have some force. His *Four Letters of Comfort* were reprinted in 1878. At his death he left his library and a handsome legacy to the university.

Boydell, John (1719-1804), Eng. engraver and print publisher, born at Dorrington, Shropshire, and educated for the Church, but early left this profession for art; about 1741 apprenticing himself to a London engraver. He soon began to publish small landscape engravings of his own, and gradually increased this practice till he built up a small business. His works have little merit besides neatness of execution. About 1751 he began the publication of the works of other engravers, and in this direction was most successful, producing the work of Woollett, M'Ardell, Hall, Earlom, Sharpe, Heath, J. Smith, Val. Green, etc. In 1790 he became Lord Mayor of London. His most famous production was the series of Shakesperian engravings which appeared in 1802.

Boyer, Abel (1667-1729) Eng. lexicographer, historical writer and translator, born at Castres, France, died at Chelsea. He pub. many works, amongst them his Fr.-Eng and Eng.-Fr. *Dictionnaire Royal*, which was compiled in 1702 and remained popular for many [illegible] re his Fr. and E[illegible] *of William the* [illegible] *the Reign of Queen Anne*, and the *Political State of Great Britain*, with fairly accurate parliamentary reports.

Boyer, Alexis (1757-1833), a Fr. surgeon, was born at Uzarches in the Corrèze. He was the son of a tailor, and acquired his first knowledge of medicine in the shop of a barber-surgeon. Proceeding to Paris he studied under Louis and Desault, and in 1794 became second operator in the Hotel Dieu. A few years later he attracted the notice of Napoleon,

who in 1808 appointed him his house-surgeon and in 1807 made him a baron. When the New Academy of Medicine was created he was one of its first members, and after Napoleon's downfall he was surgeon successively to Louis XVIII, Charles X., and Louis Philippe. As a surgeon he was at the same time judicious and daring. His prin. works were *Traité complet de l'anatomie*, 1797-9, and *Traité* [illegible]

turning to his native country, joined the army. Toussaint l'Ouverture's negro insurrection drove him back to France, where he served under Napoleon. Returning again to Haiti, he aided in the rebellion which overthrew Dessalines, the negro president (1806). Haiti now broke up into two republics under Petion and Christophe. Siding with Petion, B. became president in the S., and conquered almost all the is. In 1825 he obtained Fr. recognition of Haitian independence by paying 150,000 francs, but in 1840 a popular insurrection drove him from the is., and he fled first to Jamaica, then to Paris, where he died.

Boyesen, Hjalmar Hjorth (1848-95), Norwegian-American scholar and writer, born at Frederiksvaern, Norway; educated at Leipzig and Christiania, and in 1869 became professor of languages at Urbana University, Ohio, U.S.A. From 1874 to 1880 he was professor of Ger. in Cornell University, and held the same post in Columbia College, New York, from 1882 till his death. His works, mainly in Eng., include: *Gunnar, a Norseman's Romance*, 1873; *A Norseman's Pilgrimage*, 1875; *Falconberg*, 1878; *Goethe and Schiller*, 1878; *Ilka on the Hill-top*, 1881; *Queen Titania*, 1882; *Idylls of Norway*, 1882; *A Daughter of the Philistines*, 1883; *Essays on German Literature*, 1892; *Boyhood in Norway*, 1892. Many of them have been trans. into Ger. and Norwegian.

Boyle, Roscommon, a mrkt. tn. in co. Roscommon, Ireland, 28 m. S.E. of Sligo, on both banks of the R. B. Has considerable agric. trade, and the ruins of a fine Cistercian abbey.

Boyle, Charles, fourth Earl of Orrery and Baron Boyle of Marston (1676-1731), born at Chelsea, and succeeded to the title of Earl of Orrery in 1703. While at Christ Church, he became involved in the dispute leading up to Swift's Battle of the Books, being entrusted with the production of a new ed. of *Phalaris*, to serve as a counterblast to the *Reflections on Ancient and Modern Learning*, 1694, by Wotton, a protégé of Bentley, in which the opinions of Sir William Temple on *Phalaris* had been ridiculed. This was answered by *Dissertations* by Bentley, 1697, in reply to which B. aided by Atterbury and Smalridge, issued in 1698 *Dr. Bentley's Dissertations . . . examined*. B. was M.P. for Charleville, Ireland, 1695-9; for Huntingdon, 1701-5, and later entered the army, ultimately settling as a courtier and diplomatist in London.

Boyle, John, fifth Earl of Cork, fifth Earl of Orrery, and second Baron Marston (1706-62), son of Charles B. (*q.v.*); educated at Christ Church. Famous as a friend of Swift, Pope, and Johnson. In 1751 he pub. *Remarks on Swift*, a rancorous criticism of Swift's life and works.

Boyle, Richard, first Earl of Cork (1566-1643), Irish statesman, born at Canterbury; educated privately and at Corpus Christi, Cambridge, and entered the Middle Temple, but in 1588 left England for Ireland, where he obtained several valuable introductions. He was accused by Sir William Fitzwilliam, Sir Henry Wallop, and others, of theft and embezzlement, but put their accusations down to conspiracy, and was about to lay his case personally before Elizabeth in England when the Munster rebellion broke out, and so reduced his fortunes that he was obliged to return to law in the Middle Temple. He was soon employed by Essex in Irish State business, and was again brought to trial at the instigation of Wallop, whose accusations he was able to refute. B. was then made clerk of the council of Munster, and went over to England on missions to the queen in 1601 and 1602, on the last occasion making arrangements with Sir Walter Raleigh to purchase all his lands in Ireland, obtaining 12,000 ac. for £1000. This enormous estate he administered with great firmness and energy, making great improvements, and introducing new industries from England. In 1603 he was knighted, in 1606 became a privy councillor for Munster, in 1612 a privy councillor of state for Ireland, in 1616 was created Lord B., and in 1620 Earl of Cork, in 1629 became a lord justice, and in 1631 high treasurer for Ireland. The appointment of Wentworth (Strafford) as lord deputy in 1633 involved him in difficulties, and Strafford's impeachment was no doubt partly due to B.'s skilful and inconspicuous opposition to him. B. was able to checkmate the rebels in Munster in the 1641 rebellion.

Boyle, Richard, first Earl of Burlington and second Earl of Cork (1612-97), was son of Richard B. (1566-1643). He took an active part in the Irish Rebellion, 1642; was created

Baron Clifford of Lanesborough, Yorkshire, 1643; Lord-Lieutenant of the West Riding of Yorkshire, 1663; and Earl of Burlington, 1663. He was a supporter of William and Mary.

Boyle, Richard, third Earl of Burlington and fourth Earl of Cork (1695-17[illegible] [illegible]vy Councillor, 17[illegible] of the West Ri[illegible], Lord High Treasurer of Ireland, 1715; and K.C.G. 1730. He had travelled in Italy, and while there acquired a love for architecture. Of his works in this direction the chief are: the front of Burlington House, Piccadilly, and the colonnade within its court; the assembly-room at York; and parts of St. Paul's Church, Covent Garden.

Boyle, Robert (1627-91), an Eng. chemist and philosopher, born at Lismore, Ireland; educated at Eton and by private tutors at home and on the Continent. In 1644 he returned to *England, having inherited his father's* manor of Stalbridge, Dorset. He began at once to show a fondness for scientific studies, and was influenced in this direction by the meetings of the Royal Society, then the Philosophical College, in 1645. While in England he made a speciality of chemistry, but on visiting Ireland in 1652-3 took up anatomy. In 1654 he settled at Oxford, and erecting a laboratory, was the leader of a small scientific society. About 1659, assisted by Robert Hooke, he invented the 'machina Boyleana,' the forerunner of the modern air-pump, and by means of experiments with the elasticity, weight, and compressibility of air, estab. 'B.'s Law' about 1660-62. In 1668 he settled in London, where he became a prominent member of the Royal Society, and issued numerous scientific and philosophical works, corresponding with all the greatest men in these branches of learning throughout Europe. Throughout his life he was also an earnest student of theology, and subscribed largely to societies for the propagation of the Gospels. He appears to have been a man of singularly beautiful character, and was very popular, his reputation being international. His services to science were rather general than particular, but they were none the less valuable on this account, and he stands out as the originator of the 'experimental method.' Among his achievements may be mentioned the introduction of vegetable colour-tests of acidity, alkalinity, the preparation of phosphorus, and hydrogen, the construction of hermetically sealed thermometers, and the use of freezing mixtures, besides his researches into problems of elasticity and pressure. His complete works were pub. in five volumes in 1744.

Boyle, Roger, Baron Broghill and first Earl of Orrery (1621-79), Eng. statesman, soldier, and dramatist, born at Lismore; educated at Trinity College, Dublin, Oxford, and on the Continent. On returning to England he held commands in the Scottish expedition, and the Irish rebellion of 1641-9, and later served under Cromwell in the subjugation of Ireland. Although a Royalist at heart, he for many years was a staunch supporter of Cromwell, and sat in his parliament, returning, however, to his old allegiance at the Restoration. He wrote several dramatic and poetical works, which had some contemporary success.

Boyle Lectures, a series of lectures founded in 1691 by the will of Robert Boyle, which provided £50 per year for a minister to preach eight sermons per year 'for proving the Christian religion against Atheists, Theists, Pagans, Jews, and Mohammedans, not descending to any controversies among Christians themselves.' The office is tenable for three years, and among its holders have been Richard Bentley, 1692; Dr. Samuel Clarke, 1704; Rev. F. D. Maurice, 1846; Merivale, 1864-5; Professor Plumptree, 1866; Professor Stanley Leathes, 1868-70; Dr. Hessey, 1871-3; Henry Wace, 1874-5; Alfred Barry, 1876-8; Dr. Maclear, 1879-80; Canon Newbolt, 1896. Many of the lectures have been published.

Boyne River, rises near Carbery, Kildare, and flows N.E. by Trim, Navan, and Drogheda, into the Irish Sea; total length about 70 m. It is famous in history for the battle of the B. fought in July 1690 between William III. and James II. The former had an army of British and Dutch soldiers, with a regiment of Huguenot refugees; King James's army was mainly Irish, with some Eng. and Fr. officers. After a sharp fight the Irish were defeated, and James fled to France. An obelisk near Drogheda marks the scene of the battle.

Boyne, Leonard, actor, born in Ireland, 1853. He made his début at the Theatre Royal, Liverpool, 1870, as Leybourne in *The Flowers of the Forest*. He then toured in various towns in England and Wales, first appearing in London as John Ferne in Robertson's *Progress*, at St. James's Theatre, 1874. He then appeared as Sir Francis Levison in *East Lynne*. B. has also played in *Such is the Law* (1878), *A Gay Deceiver, Delilah* (as Colonel Tempest), *Sister Mary, Poor Relations, Ariane, The Armada, A Man's Love* (1889),

The Lights o' London, Alone in London, Heart of Hearts, The English Rose, The Streets of London, The Trumpet Call, The Prodigal Daughter, The Masqueraders, The Benefit of the Doubt (1895). *The late Mr. Castello, Gossip, For Auld Lang Syne* (1901), *Becky Sharp* (as Rawdon Crawley), *The Marriage of Kitty* (1902). He toured with his own company in *The White Horse of the Peppers, His Last Legs, The Serious Family.* He has also played D'Alroy in *Caste* (1889), and in *Our Boys.* In 1905 he played Paul Sylvaine in *Leah Kleschna;* toured with *Raffles,* 1906; appeared in *The Stronger Sex, The Rivals* (1910), and toured as Frampton in *Nobody's Daughter,* 1911. He was the first representative in the English provinces of Claudian and other modern parts, and has also acted in New York.

Boyneburg (Bemelberg), Konrad (Kurt) von (1494-1567), one of the most renowned leaders of the Landsknechte in the time of Kaiser Karl V. For a time he was page at the Court of Duke Ulrich von Würtemberg. He was trained in warfare under Sickingen and Frundsberg. On the expedition to Italy, B. was chosen as Frundberg's deputy, and on the latter's sudden illness became commander-in-chief. He distinguished himself at the storming of Rome (1527), the defence of Naples (1528), and the capture of Florence (1530). He fought also in the war against the Turks, 1532. In 1540, in the service of Duke von Bayern, he fought repeatedly against the Turks and French. In 1544 he captured Vitry and Meaur. The last battle at which he was present was St. Quentin, 1557. In 1571 Maximilian II. raised B.'s descendants to the rank of barons of the realm. *See* Solger, *Der Landsknechtsobrist Konrad von Bemelberg,* 1870.

Boys' Brigade, The, was founded in 1883 by Mr. (afterwards Sir) William A. Smith, of Glasgow, with the object of promoting among boys 'habits of obedience, reverence, discipline, self-respect, and all that tends towards a true Christian manliness.' The Brigade consists of 1300 companies of boys between the ages of twelve and eighteen. Each company is connected with the church or other Christian body. Military drill is used as a means of banding the boys together, and of training them in discipline and self-respect. Bible classes, gymnastic training, ambulance work, bands, club-rooms, scouting, athletics, swimming, and summer camps are extensively carried on. Membership, 8500 officers and 60,000 boys in the United Kingdom; 115,000 officers and boys throughout the world. Headquarters, 30 George Square, Glasgow; London office, 34 Paternoster Row, E.C.

Boy Scouts. The association of B. S. was recently started (early in 1908) by Lieutenant-General Baden-Powell as the moving spirit. It is somewhat similar to the original Boys' Brigade of 1883. It has no definite military drill, but aims at training boys to be manly, self-reliant, and self-respecting. They learn to be quick and ready in action, and to co-operate one with another. The movement is largely to inculcate a spirit of patriotism into boys of all classes, and to train up young men to form an intelligent subsidiary force to the army if necessary. The boys practise signalling, tracking, and stalking, camping out, reconnoitring, and various other useful branches of military knowledge. Cooking and first-aid classes are attended, and observation of nature is encouraged. The unit for work is the 'patrol,' a party of some six or eight boys under a boy leader. Any number of patrols may form a troop, under a Scoutmaster and his assistants. These are supervised in the different dists. by a local committee of scoutmaster representatives. The administration is based on decentralisation of authority and responsibility. Funds are raised locally. In 1911 permission was granted for a detachment of scouts to be sent to the annual military manœuvres. They often give demonstrations of camp-pitching, etc., at fêtes. Their uniform, of khaki-colour, varies in some details for the different troops (scarf, badge, or stockings). They have brimmed hats and the scout-pole. In Great Britain the number of members is already about 200,000. The movement has been eagerly taken up in Canada, Australia, New Zealand, and elsewhere, and is spreading to Germany, France, Spain, Norway, and other parts. The pledge taken is: 'I will do my duty to God and my country. I will do my best to help others, whatever it costs me. I know the scout law and will obey it.' The movement in England has official papers in the weekly *Scout,* and the monthly *Headquarters Gazette.* A movement of a similar nature for 'Girl Guides' has been started. Headquarters, 114-8 Victoria Street, Westminster, S.W. *See* Baden-Powell's *Scouting for Boys* and article in *National Defence* (August 1910). For aims *see* Sadler's *Continuation Schools in England and Elsewhere,* 1907.

Bozen, *see* BOTZEN.

Bozrah, possibly el-Busseirah, S.E. of the Dead Sea, anct. cap. of the Edomites; or perhaps Bosra in the

Hauran, S. of Damascus, with anct. Roman ruins, a populous city in mediæval times, now only a village.

Bozzaris, Marcos (1788-1823), a celebrated Greek patriot, born at Suli in Epirus. At an early age he entered into the struggle for the independence of Greece, but was defeated in 1803 by Ali Pasha, who forced him to retreat to the Ionian Isle. In 1820 Ali led an insurrection against the Sultan, and was joined by B. with 800 Sulistes who had been expatriated. B. was successful in several engagements, and continued the war after the death of Ali. He was defeated in 1822 at Petta and driven back to Missolonghi, which he defended very ably. He fell at Karpenisi whilst leading a daring night assault upon the Turkish-Albanian army, which was completely routed although of far superior strength.

Bozzolo, a tn. in Venetia, Italy, in the prov. of Mantua, with silk-worm breeding. Pop. less than 5000.

Bra, a tn. in Piedmont, 31 m. S.S.E. of Turin; breeds silk-worms, and has considerable trade in wine and silk. Pop. 16,000.

Brabançonne, the Belgian national anthem, written and composed during the revolution of 1830, when Belgium broke away from Dutch rule. The words were by a Frenchman, Jenneval (or Dechet), the music by a Belgian, Campenhout. Jenneval was killed near Antwerp, October 1830.

Brabant. Early in the 15th century the Duchy of B., through intermarriage, became incorporated with Burgundy, and on the marriage of Mary of Burgundy to the Emperor Maximilian was transferred first to the Austrian empire, then under Charles V. to the Spanish crown. During the Netherland rebellion, N. B. became a Dutch prov., while S. B. remained Spanish till 1714, after which it fell in turns to the Austrians, Fr., and Netherlanders. In 1830 the Belgians achieved their independence and S. B. is now their central prov. It is very densely peopled (area 1268 sq. m., pop. 1,370,000), and rich both in agriculture and manufs.: chief cities Brussels, Louvain, and Nivelles. N. B. is larger, but poorer, being very marshy. Area 1980 sq. m.; pop. 630,000. Chief tn. Hertogenbosch.

Brabant, Major-General Sir Edward Yewd (*b.* 1839), joined the Derby militia in 1855, and the year following went to S. Africa, where he entered the Cape Mounted Rifles. Since then his life has been entirely given to the service of his adopted country. He was for many years member for E. London in the Cape parliament, and was appointed commander of the Cape Yeomanry during the Zulu War of 1879. When troubles with the Transvaal came to a head in 1897, Colonel B. was president of the S. African League, and on the outbreak of war in 1899 he raised [illegible] it's Horse' [illegible] id service [illegible] In 1900 [illegible] 1902 commandant-general of the Cape forces.

Brabazon, Major-General Sir John Palmer, *b.* 1843 in co. Mayo, Ireland. He joined the Grenadier Guards, exchanging later into the cavalry. His first campaign was in Ashanti, 1874. In 1878 he served in Afghanistan, and was one of the foremost at the capture of the Peiwar Kotal. In 1879, acting as brigade-major of the cavalry div., he took part in the battle of Charasiab and the fighting round Cabul, and in 1880 shared in Roberts' famous march to Candahar, and the victory over Ayoub Khan's army on Sept. 1. In the Suakim campaign of 1884 he fought at El Teb and Tamai, and served with the Light Camel Corps in the attempt to relieve Gordon, being present at the battle of Abu Klea (Feb. 1885). In the Boer War he led the second cavalry brigade, under French, during the famous operations round Colesberg (Jan. 1900), and afterwards commanded a div. of Imperial Yeomanry. He retired from the army in 1901, was made C.B. in 1903, and K.C.B. in 1911.

[illegible] *see* BRAGA.

[illegible] the anct. *Lacus* [illegible] m. N.W. of Rome. The basin of the lake is almost circular, and is either an extinct crater or a hollow caused by volcanic subsidence. The lake is 28 sq. m. in area, and 538 ft. above the sea, but so deep that its floor is actually *below* sea level. It has always been famous for excellent fish. Around its shores are many ruins of Rom. and perhaps even earlier origin.

Braccio, Fortelracci, or Braccio di Montone (1368-1424), an It. soldier, born in Perugia. He belonged to the Patricians of the family of Fortelracci, and afterwards took up the cause of the nobles who had been banished from his native city. In 1417 he conquered Rome, but was afterwards driven from it by his rival Sforza, who was at this time the leader of one faction of soldiers, while B. was the leader of the rival one—the country being divided into these two factions. Eventually he entered the service of the King of Naples, but was wounded, conquered, and died while laying siege to Aquila.

Bracciolini, Francesco (1566-1646), It. poet, surnamed dell'Api, born at Pistoja. His talents gained him early

admittance to the academy of Florence, where he made many valuable friends. Through the influence of Cardinal Barberini, afterwards Urban XIII., he became secretary to Cardinal Antonio Barberini, and went with him to France. His works include a heroic poem, *La Croce Racquistata* (The Cross Regained), ranked by some critics next to Tasso's *Jerusalem Delivered; Lo Scherno degli Dei*, an imitation of Tassoni's *La Secchia Rapita*; *L'Assedio della Rocella*, a heroic poem in twenty cantos; and a poem on the election of Pope Urban XIII., who granted him the privileges of adding the Barberini arms to his own and styling himself B. dell'Api.

Bracciolini, Poggio (1380-1459), It. author, born at Terranuova. He was one of the leading scholars of his day, and at an early age he became secretary to Pope Boniface IX., and attended the Council of Constance in 1414. He was an eye-witness of the martyrdom of Jerome of Prague, of which he has left an exact account. It is to B. that we owe some old and valuable manuscripts, as he spent a great deal of his time in research in France and Italy and in copying these manuscripts—among them works of Cicero, Ammianus Marcellinus, Lucretius, Plautus, and others. See *Life* by William Shepherd.

Brace, Charles Loring (1826-90), an American author and philanthropist, was born at Litchfield, Connecticut; studied at Yale, and took a theological degree in 1849. For some years he travelled a great deal, especially in Europe, and then settled down to social and philanthropic work in New York, taking particular interest in the training of boys and the reformation of criminals. He wrote sev. books of travel, and others on the application of Christian ideals in the working out of social reforms. A biography, with letters, was pub. by his daughter in 1894.

Bracebridge, a small tn. in Canada situated on the Muskoka R., in Muskoka co., Ontario. It is about 60 m. N.E. by E. from Collingwood.

Bracegirdle, Anne (c. 1663-1748), Eng. actress of the 17th century. The date of her birth is usually assigned to 1663, but by some it is put ten years later. She had a brilliant career on the stage till, in 1707, she and her rising rival, Mrs. Oldfield, played Mrs. Brittle in Betterton's *Amorous Widow* on successive nights. The audience awarded the palm to Mrs. Oldfield, whereupon her rival quitted the stage, never to return, except for Betterton's benefit performance in 1709. She achieved her greatest successes as an actress in the plays of Congreve, to whom she was suspected of being secretly married. Rightly or wrongly, she had a high reputation for virtue.

Bracelet (Lat. *brachiale*, from *brachium*, the arm), an ornament worn from time immemorial by both sexes. Bs. are repeatedly mentioned in the Bible; Abraham's servant presented Rebekah with two gold Bs. (Gen. xxiv. 22), and one was taken, probably a royal armlet, from Saul as he lay dead on Mt. Gilboa (2 Sam. i. 10). Throughout the East, in anct. times, an armlet of plain or enamelled metal was a regal ornament; Egyptian kings are represented as wearing such, and Bs. are still worn by Eastern princes. Among the Latin tribes *Armillæ* were very massive, Petronius Arbiter says they sometimes weighed over six pounds. The Roms. often awarded them as decorations for valour, to their own people only; on foreigners torques or other ornaments might be bestowed. Bs. were often given in Rome as birthday or wedding presents; as a rule virgins did not wear them. Among the Gks., who got their first designs from Asia, the snake-pattern was common, also penannular hoops with finial decorations. Among early Teutons and Scandinavians bronze armlets were often very large, protecting the whole fore-arm, and Bs. were often given to brave warriors; in the Saxon Chronicle King Edgar is called 'bestower of Bs.,' as is also Athelstan (*Song of Brunanburh*); this term is often applied to great chiefs. Very ancient Bs. were simple in pattern, of easily worked metals, gold, silver, copper, and bronze. As skill and luxury increased, the choice of materials became more varied, brass, polished steel, etc., being used, and jewels freely employed in the decorations, especially in India and Persia, where these ornaments were often of fabulous cost. One pair of Bs., taken at the sack of Delhi by Nadir Shah (1739) was valued at a million sterling. Designs also multiplied greatly; highly wrought panels joined by clasps were among the triumphs of Etruscan art. Among barbaric tribes beads and plaited wire are much used to this day; the Kaffirs of S. Africa are very skilful in making Bs. of the latter material.

Braces (*cf.* Fr. *bras*) are ropes attached to the yard-arms of vessels, by means of which the yards can be swung round and so the sails 'trimmed.'

Brach is a term derived from the Fr. *brache*, to indicate a scenting or hunting dog of the hound type. It is applied to the female.

Brachial Artery, the artery of the upper arm. It is a continuation of the

axillary artery, and proceeds from the armpit downwards and outwards along the inner side of the arm, reaching the middle of the bend of the elbow. Its branches are the *superior profunda*, springing from the inner and back part of the brachial soon after its commencement; the *inferior profunda*, a smaller artery springing from the middle of the brachial; the *anastomotic*, providing the anastomoses (*q.v.*) at the elbow; and muscular branches to the muscles of the upper arm. The brachial subdivides in the lower arm into the radial and ulnar arteries.

Brachial Plexus, an aggregation of nerves in the lower part of the neck and armpit. The nerves engaged are the fifth, sixth, seventh, and eighth cervical and the first dorsal nerves.

Brachinus, a genus of coleopterous insects of the family Carabidæ, of which sev. species are British. *See* BOMBARDIER BEETLE.

Brachionus is a genus of microscopic and aquatic beings of the phylum Rotifera and order Ploima. They have a long flexible foot ending in two toes, and they swim by means of minute cilia. *B. urceolarius* is the commonest species.

Brachiopoda, though classed by Cuvier among the Molluscs, bear no affinity to them, and constitute a separate phylum of the animal kingdom. They bear some affinity, however, to the Polyzoa and Annelida, but the resemblance to the Lamellibranchs, or true bivalves, is again superficial. The bivalve shells of the Brachiopods lie dorsally and ventrally, are unequal in size, and are symmetrical about the median line, while the shells of the Lamellibranchs lie right and left, are equal, and unsymmetrical about the median line. In this phylum the species are fixed, solitary, unsegmented, and often have spirally-coiled arms round the mouth. They are found at different depths in all seas, and the oldest fossils known are Brachiopods. They are divided usually into the two orders *Ecardines*, of which the species have shells without a hinge, and *Testicardines*, of which the species have hinged shells. *See* T. Davidson's *Monograph of the British Fossil Brachiopoda*, 1851-84; T. H. Huxley's *Contributions to the Anatomy of the Brachiopoda*, 1854.

Brachycephalic, a term applied to skulls of which the transverse diameter is more than eight-tenths of the long diameter. The heads of most individuals of civilised races are B., width in com- the skull has to mark the development of the civilised element in races. This is a generalisation which, however, is by no means always true.

Brachycerus, a genus of coleopterous insects of the family Curculionidæ, which are apterous and generally very rough. These weevils live on the ground in S. Europe and Africa.

Brachypodium, or false brome-grass, is a genus of tropical and temperate Gramineæ, of which there are two British species, *B. sylvaticum* and *B. pinnatum*. The former grows in woods, the latter on open heath; the inflorescence is a simple raceme with unequal glumes.

Brachypteryx montana is a member of the family Timeliidæ, or babbling thrushes; by Latham it was called the mountaineer warbler, and by the Javanese it is known as *ketek*. In colour it is indigo, black, and white, in song it is garrulous and plaintive, in habit it is insectivorous, and builds its nest on the ground. It inhabits the wooded peaks of Java.

Brachyteles is the name of a genus of Cebidæ, consisting of three species of prehensile-tailed monkeys found in America. They have woolly, hair but the long tail is naked towards the tip, and the pollex is reduced.

Brachyura (Gk. βραχύς, short, οὐρα, tail) is the name applied to a large div. of decapod crustaceans which are characterised by having the short tails tucked up beneath them, *e.g.* the long- lobsters. metimes ts, and *Brachyurus* to a genus of short-tailed monkeys of S. America.

Brackel, a vil. in Germany, situated in the prov. of Westphalia, Prussia. It is about 4 m. N.E. from Dortmund.

[illegible] *Blechnum spicant*, is a ich is very It has a creeping rhizone which grows at some depth below the surface of the soil, and sends up every year one large, much-divided leaf, known as a frond, at the base of which there is a nectary. On the back of the leaf-stalk it produces adventitious buds. In the B. there is a true lateral indusium, which is a delicate membrane of a yellow colour, and the margin of the pinnule bends over to protect the sporangia, thus forming a false indusium.

[illegible] Booth (1831- Bayswater. Academy, Woolwich, where he became assistant instructor in assistant direct- 1864. He served in the Crimea, 1855-56, being present at the siege of Sebastopol. B. was military corre-

spondent of the *Times* in the Prusso-Austrian (1866), Franco-Ger. (1870-1), and Russo-Turkish (1877-8) wars. He was superintendent of Waltham gunpowder factory, and director of the Artillery College. He wrote books and papers on military affairs —especially tactics. These include *The Constitutional Forces of Great Britain*, 1869; *Foreign Armies and Home Reserves*, 1871; *Field Works*, 1888; *Reforms in the French Army*,

Brackenbury, General Sir Henry, *b.* 1837 in Lincolnshire; he joined the Royal Artillery in 1856, and served in Central India during the Mutiny. In 1870-71 he assisted in the work of relieving the sick and wounded in the Franco-Ger. War. He went through the fighting in Ashanti, 1874, and in 1879-80 served as chief of the staff in the Zulu War. Returning home he was successively private secretary to the Viceroy of [illegible] attaché, Paris [illegible] under-secretar [illegible] 85 he led the river column in the Soudan campaign with such success that he was promoted to be major-general. From 1886 to 1891 he was director of military intelligence, from 1891 to 1896 a member of the Indian council, from 1896 to 1899 president [illegible]

of the Three Arms, 1873; *Narrative of the Ashanti Column*, 1885; and *Some Memorials of my Spare Time*, 1909. He was made K.C.B. in 1894, K.C.S.I. in 1896, and P.C. in 1904.

Brackenbury (or Brakenbury), Sir Robert, descendant of a family in Durham dating back to the end of the 12th century. Master and worker of moneys, and keeper of the king's exchange at the Tower, with jurisdiction over England and Calais; constable of the Tower for life, 1483. He served against the rebels under the second Duke of Buckingham, and was rewarded by Richard III. for his services by various grants. Keeper of lions in the Tower, 1484; vice-admiral and commissioner of the Admiralty; commissioner of gaol delivery for Canterbury and Kent; knighted; constable of Tunbridge Castle; sheriff of Kent for some months, 1485. B. is said to have refused to murder the two little princes, but to have given over his keys to Tyrrell at Richard's command. He fought for Richard at Bosworth and was killed, 1485. *See* More's 'Life and Reign of Richard III.,' in Kennet's *History of England*; 'Croyland Continuator,' in Gale's *Rerum Anglicarum Scriptores*, i.; Walpole's *Historic Doubts*, 1798; *Eng. Hist. Review*, vi., 1891.

Bracket, a metal or wooden support which projects from a wall. Bs. have two uses. In architecture they support heavy weights, such as balconies and as articles of furniture they are used to support much lighter things, such as lamps and ornaments of all kinds.

Bracklesham Beds, a sub-group of Bagshot Beds, being fossiliferous beds of strata belonging to the Middle Eocene formation. They are found in the cliffs round Bracklesham, Sussex, and the Isle of Wight.

Brackley, a market tn. and bor. in Northamptonshire; chief industries, brewing and boot-making. Once had considerable wool trade, and sent two members to parliament; has fine church, and school founded by William of Waynflete, 1447. Pop. 2500.

Brackwede Brock, a small tn. of Westphalia, Prussia, 2½ m. from Bielefeld, and near the Teutoberger-wald range. Pop. 10,000.

Bracon, the typical genus of the Braconidæ in the Hymenoptera. It is a large genus, widely-distributed in Britain, with parasitic larvæ, and differs from the Ichneumon-flies in having the cubital cell of the fore-wing separated from the second cubital by a single cell.

Bract, or **Hypophyll**, is the name given to the leaf in the axil of which a flower is produced; all plants do not have such leaves, and are then called *ebracteate*, while others, as the lily of the valley, bear Bs. and are said to be *bracteate*. If there are any other leaves between these and the floral leaves they are called *bracteoles*, but these are often absent. B. leaves may be scaly, leafy, membranous, woody, or coloured; *petaloid* examples may be seen in the Bougainvillea. When they are arranged in a circle they form an *involucre*, as in the head of a daisy, or the three green leaves of the anemone; when they form a solid cup, as in the acorn, it is called a *cupule*; a single large B. which protects an inflorescence, as in the arum, is a *spathe*.

Bracton, Henry de (*d.* 1268), interred in Exeter Cathedral. Was an English judge and writer on law. He was clerk in the king's service in the early part of his career, under the patronage of William Rayleigh. In 1245 he appeared as justice, and from 1248 until his death was a justice of assize in Somerset, Cornwall, and Devon. For a time he was also employed as judge in the king's central court, but 1257 saw him dismissed, probably owing to his connection with political events of that period. In 1259 he was made rector of Combe-in-Teignhead, and two years later he became rector of Barnstaple; 1264

saw him archdeacon, and a year or so before his death he attained to the chancellorship of Exeter Cathedral. His fame is chiefly due to his treatise on the laws and customs of England, the greater part of which was compiled 1250-56, and although it remained unfinished, it is considered the best work of any English lawyer of the middle ages.

Braddock is in the co. Allegheny, United States. It is situated on the R. Monongahela in South-western Pennsylvania, about 10 m. S.E. from Pittsburg, at an alt. of 830 ft. There are extensive iron works in the neighbourhood.

Braddock, Edward (*c.* 1695-1755), a British general, was born in Perthshire, being the son of Major-General Edward B., and entered the army in 1710. During the later years of the War of the Austrian Succession he fought in Holland, being then a lieutenant-colonel. In 1754 he was made a major-general, and in the following year he went to Virginia to command the British forces against the French. He was much hindered by the supply arrangements, but finally took the field with about 2000 men, amongst whom was the afterwards famous George Washington, and he attempted an attack upon Fort Duquesne (now Pittsburg). The column fell into an ambush of French and Indians, and were completely routed; B. himself, after conspicuous gallantry, and after having times without number rallied his men, was shot and fell mortally wounded. He died shortly afterwards, and was buried at Great Meadow.

Braddon, Mary Elizabeth (*b.* 1837), a popular English novelist, was born in London, and showed literary talent at a very early age, writing both for periodicals and for the theatre. Her first great success was *Lady Audley's Secret*, 1862, which she followed up with *Aurora Floyd* and *Eleanor's Victory*, 1863, and *Henry Dunbar*, 1864. These are all 'sensational' novels, constructed on melodramatic lines, with skilful and exciting plots and plenty of variety. Though never rising to the highest levels of fiction, Miss B., who has written more than fifty novels, has shown wonderfully sustained powers, her latest book, *Beyond these Voices*, 1910, being pronounced by many critics quite equal to any of its predecessors, but probably it will be by her earlier works that she will be best remembered. Sev. of her stories appeared as serials in *Belgravia*, which she ed. for many years. In 1874 she married Mr. John Maxwell, publisher, and their son, Mr. W. B. Maxwell, has already won considerable repute as a novelist and journalist.

Bradford, Yorkshire, a city, municipal and co. bor., has been connected with wool in one form or another for six centuries. In 1311 a fulling mill was at work there, and for 300 years woollen manuf. was its staple industry, but in the 17th century the worsted trade began to drift from E. Anglia to the N., and B. became one of its chief seats. There are now 300 large factories for the weaving of worsted, velvet, plush, alpaca, mohair, and other textile materials, also iron and engineering works, B. being the centre of a busy coal and iron mining dist. It has many fine public buildings, including the Town Hall, Mechanic's Institute and Hall, St. George's Hall, and the Cartwright Gallery and Museum. Besides sev. parks, Baildon Moor (670 ac.) is kept as a recreation ground. B. became a parl. bor. in 1832, returning two members; in 1885 these were increased to three. In 1897 it was created a city, and in 1907 received the honour of a Lord Mayor. Pop. 300,000.

Bradford, Pennsylvania, a city in the N. of the state, in a rich oil-producing dist. Has large petroleum refineries, also manufs. iron ware, glass, chemicals, etc. Pop. 20,000.

Bradford, Sir Edward Ridley Colborne, G.C.B., K.C.S.I. (1836-1911), joined the Madras cavalry in 1853. During the Mutiny he distinguished himself particularly in the operations against Tantia Topee, and afterwards acted first as political agent, then head of the criminal dept. concerned with Thuggism, and later as political secretary to the Indian gov. Returning home, he was in 1890 appointed Commissioner of Police in London. He was made G.C.B. in 1897, and baronet on his retirement in 1903.

Bradford, John (*c.* 1510-55), Eng. Protestant preacher. Rather reckless in youth, he was educated at Cambridge (becoming fellow of Pembroke Hall), and converted by Latimer. B. became Ridley's chaplain, 1550; prebendary of St. Paul's, 1551; royal chaplain to Edward VI., 1553. His preaching won praise from John Knox. Tried before Gardiner and Bonner, he was burnt at Smithfield under the Marian persecutions. *B.'s* writings were ed. by Townsend for the Parker Society, 1848-53. *See* Stevens's *Life*, 1832.

Bradford, Samuel (1652-1731), an English bishop, educated at St. Paul's School and, after the plague and fire, at Charterhouse; went to Cambridge, 1669, leaving without a degree because of religious scruples. Studied medicine for a time; in 1680 was admitted to degree of M.A. by royal mandate; 1697 was incorporated at

Oxford. B. took orders after the Revolution, becoming deacon and priest, 1690; 1691 minister of the church in Southwark, and one of the governors of St. Thomas's Hospital. Became tutor to grandsons of Archbishop Tillotson, being made rector of St. Mary-le-Bow, 1693; B. often preached before the corporation of London, and lectured at various places. He was a staunch Whig and Protestant; 1698 William III. made him royal chaplain in ordinary. He continued in office under Anne, becoming prebendary of Westminster, 1708; in 1699 B. gave the Boyle lecture in St. Paul's; also others between 1691-1732. He preached sermons on 'The Credibility of the Christian Revelation, from its Intrinsick Evidence.' These were published with others in *A Defence of Natural and Revealed Religion*, 1739. Bishop of Carlisle, 1718; bishop of Rochester and dean of Westminster, 1723. His work, *Discourse concerning Baptismal and Spiritual Regeneration*, 1709, was very popular. A 9th ed. appeared 1819, published by S.P.C.K. See *Gent. Mag.*, May 1731; Birch's *Life of Tillotson*, 1752; Le Neve's *Fasti*, 1854.

Bradford, William (1590-1657), an American colonial governor and historian, born near Doncaster. As a 'Pilgrim Father' sailed in the *Mayflower* for Virginia, 1620, but through storms landed at Plymouth, U.S.A. B. succeeded Carver as governor of this settlement, 1621, ruling firmly and wisely, and showed tact in dealing with the Indians. He was author of *History of Plimouth Plantation*, pub. in *Proceedings* [illegible] *torical Society*, [illegible] on church gov [illegible] *nalia*, 1702; [illegible] *England Leaders*, 1901; Hunter's *Collections concerning the Founders of New Plymouth*, 1852.

Bradford Clay, a marly stratum, forming a subdivision of the Great Oolite, found at Bradford, near Bath. Crinoids, *Apiocrinites Parkinsoni*, occur in great numbers, showing that the rock on which the clay is deposited once formed the bottom of the sea where these animals must have lived till they were covered with mud.

Bradford-on-Avon, an anct. market tn. in Wiltshire, near Bath. St. Aldhelm was abbot of B. monastery in A.D. 705, and the little church of St. Lawrence, still perfect, dates from Saxon times. B. is mentioned as a bor. in Domesday Book. Under the Stuarts it was the chief cloth-manufacturing tn. in the W. of England, but its prin. industries now are brewing and the making of rubber goods. Pop. 4500.

Brading, a small tn. near Ryde, Isle of Wight. There are traces of a Rom. settlement in the vicinity. The Rev. Legh Richmond, author of *The Annals of the Poor*, was curate here from 1797 to 1805.

Bradlaugh, Charles (1833-91), Eng. secularist and politician, was born in Hoxton, London. Being the son of a solicitor's clerk, in poor circumstances, he went to work as an office-boy, but while still a lad imbibed freethinking ideas, and through them lost his situation. At seventeen he enlisted as a soldier, but bought himself out after a few years. He then became a 'freethought' writer and lecturer, calling himself 'Iconoclast,' and gradually rose to be a prominent leader among 'advanced' political societies, Reform Leaguers, Secularists, and Land Law Reformers. His paper, the *National Reformer*, was prosecuted by gov. for blasphemy and sedition in 1868, but B. defended himself with much skill and judgment was eventually given in his favour. His determined advocacy of atheistical and republican opinions aroused intense opposition, and for some years he was continually attacked both in the law courts and the press. This antagonism was in 1876 intensified by his republishing, in alliance with Mrs. Annie Besant, an American pamphlet, *The Fruits of Philosophy*, which had already been condemned by an Eng. court of law. For this, as an indecent and immoral publication, B. and Mrs. Besant were sentenced to imprisonment and a heavy fine, but an appeal resulted in their favour on a technical point. Mr. B. had for some years been seeking to enter parliament, and in 1880 was elected for Northampton; refusing, however, to take the oath he claimed liberty to affirm under the Parliamentary Oaths Act, but he was rejected by the House, his subsequent offer to take the oath 'as a matter of form' being regarded as insulting. After being re-elected four times, he was at last permitted to enter, on his own terms, in 1886. As often happens the atmosphere of parliament had a refining influence upon him, and during the five years of his membership his courage and honesty had won the respect even of his opponents.

Bradley, Andrew Cecil (*b.* 1851), LL.D. and Litt.D., was educated at Cheltenham and Balliol College, was elected fellow of Balliol in 1874, and lectured there from 1876 to 1881. He was professor of modern literature at University College, Liverpool, from 1881 to 1889, and at Glasgow University from 1889 to 1900, then professor of poetry at Oxford from 1901 to 1906. He has pub. a *Commentary on*

'*In Memoriam*,' 1901; *Shakespearean Tragedy*, 1904; and *Oxford Lectures on Poetry*, 1909.

Bradley, Rev. Edward, writer, graduated at Durham University in 1848. As a contributor to many periodicals, including *Punch* and *Leisure Hour*, he was well known to his contemporaries, but his claim to posthumous fame rests on his *Adventures of Mr. Verdant Green, an Oxford Freshman*, 1853. It is full of fun, and, considering the author was not an Oxford man, remarkably true to life.

Bradley, Francis Herbert (*b.* 1846), half-brother to Dean B.; fellow of Merton College, Oxford. Has written: *The Presuppositions of Critical History*, 1874; *Ethical Studies*, 1876; *The Principles of Logic*, 1883; and *Appearance and Reality*, 1893.

Bradley, George Granville (1821-1903), *Dean of Westminster*, was educated at Rugby under Arnold, and at University College, Oxford, where in 1844 he was elected a fellow. In 1845 he went as assistant-master to Rugby, and in 1858 was appointed headmaster of Marlborough, where he was very successful. His personal influence was remarkable; Tennyson said he sent his son 'not to Marlborough but to Bradley.' Returning to University College in 1870 as its head, and finding the standards both of discipline and learning only moderate, he set to work as a reformer with such success that admission to his college became an honour to be competed for. On Dean Stanley's death in 1881, B. was chosen to succeed him. Here again he had much to do; the buildings were dilapidated, and funds were lacking, but the Dean's energy and persistence overcame difficulties, and the necessary repairs were carried out. He also set on foot an inquiry into the question of future burials and monuments in the over-crowded Abbey, and organised a system of memorial services. After the coronation of Edward VII. (Aug. 1902), Dean B. retired from office. He was buried i Abbey.

Bradley, Henry (*b.* 1845), lexicographer, was born at Manchester, and educated at Chesterfield Grammar School. For some time he was clerk and foreign correspondent in Sheffield, but went to London in 1884, and became a contributor to various literary journals, and for a time editor of the *Academy*. He has been three times president of the Philological Society. His chief original works are *The Story of the Goths*, 1888, and *The Making of English*; as editor he has brought out sev. important works, including *Caxton's Dialogues* (Early English Text Society) and a revision of Morris's *Elementary Lessons in English Grammar*. Since 1889 he has been part editor of the Oxford *New English Dictionary*.

Bradley, James (1693-1762), English astronomer, born in Gloucestershire at Sherbourne, and entered Balliol College, Oxford, in 1711, where he took his B.A. in 1714 and his M.A. in 1717. He was given his first great interest in astronomy by his uncle, the Rev. James Pound, and his own genius for mathematics and astronomy soon won him the friendship of many learned scientists. He became a fellow of the Royal Society in 1718. Until 1721 he was in holy orders, but in that year he resigned his ecclesiastical preferments in order to take up the professorship of astronomy at Oxford. In 1739 he put forward his famous theory of the aberration of light, and in 1748 the theory of nutation, which was supplementary to his previous discovery. In 1742 he became astronomer royal, and was able to obtain a large amount of new apparatus to further his discoveries. He was offered the vicarage of Greenwich, which he refused, but in 1752 he was given a crown pension of £250 per annum. He retired to Gloucestershire, where he died. His works were published by the Clarendon Press, Oxford, between 1798 and 1805.

Bradshaw, George (1801-53), born at Pendleton, Lancashire, was in business at Manchester as a map-engraver and printer when the railway era began, and in 1839 he pub., at sixpence, the first of his *Railway Time Tables*. In 1840 this was enlarged and raised in price, but in Dec. 1841 he began a monthly issue of the tables once more at sixpence, and in 1847 commenced his *Continental Railway Guide*. He was a member of the Society of Friends.

Bradshaw, Henry (*c.* 1450 – *c.* 1513), an Eng. Benedictine monk and poet, born at Chester. Studied theology at Oxford, and then returned to his monastery at Chester. His *De Antiquis Urbis Cestrie* [illegible] *St. Werburgh*, largely a compilation, remains. It is written in Eng. seven-lined stanza. Consult Thomas Warton, *History of English Poetry* (ed. Hazlitt), 1871, and Horstmann's edition of the *Holy Lyfe*, 1887; Pynson's edition (1521) is rare.

Bradshaw, Henry (1831-86), an Eng. scholar and librarian, born in London, educated at Eton and King's College, Cambridge, of which he became a fellow, 1853. After a short scholastic career in Dublin he returned to Cambridge as assistant in the University Library. This post he resigned to gain more time for antiquarian re-

search, and he compiled a catalogue of the MSS. of the library. His discovery in 1857 of the *Book of Deer* threw light on ancient Celtic language and literature. Another important discovery was that of MSS. containing the earliest remains of the Waldensian language and literature. In a letter to the *Guardian*, 1863, he exposed the frauds of Simonides, who pretended to have forged the *Codex Sinaiticus*, brought from the Gk. monastery of Mt. Sinai by Tischendorf. In 1866 he discovered two previously unknown poems—*Legends of the Saints*, and some lines on the *Siege of Troy*, which he found in a MS. of Lydgate's *Troye Booke*. These he erroneously attributed to Barbour. B. turned his attention to such a large variety of subjects that his literary remains are hardly an adequate criterion of his powers. Praise is due to him not only for his valuable discoveries, but also for his efforts to improve the standard of library administration. His duties as university librarian, 1867; dean of his college, 1857-65; and prælector, 1863-8, occupied much of his time. His *Collected Papers* were pub. by F. Jenkinson, 1889. Consult the *Memoir* by G. Prothero, 1888, and C. F. Newcombe, *Some Aspects of the Work of Henry Bradshaw*, 1905.

Bradshaw, John (1602-59), the president of the court which sentenced Charles I. to death. B. was born in Cheshire, and received a fair education, being called to the bar in 1627. He became of sufficient prominence in his native county to be mayor of Congleton, and later recorder of the borough. He became prominent as a lawyer, and took part in a number of trials of importance during the period 1640 to 1647. In 1647 he was made chief justice of Cheshire and a Welsh judge. In 1649 the remnant of the House of Commons which still existed after Pride's Purge had determined to bring the king to trial. The leaders of the bar, quite apart from their political opinions, refused to take part in a trial which they knew to be both illegal and unconstitutional. B., however, accepted the post of president of the court, a court the jurisdiction of which Charles I. quite rightly, but quite uselessly, refused to recognise. B. put aside all legal objections to the court, and even refused to allow Charles to speak in his own defence. After the execution of the king, B. became one of the prominent leaders of the Commonwealth. He was always a staunch republican, and he branded as illegal Cromwell's dissolution of the Rump Parliament. He was an opponent of Cromwell during the Commonwealth period, and was by him practically forced into retirement. He again appeared in 1689 after the abdication of Richard Cromwell, but died in Oct. of that year. He was buried in Westminster Abbey, but his body was disinterred on the Restoration.

Bradshaw, William (1571-1618), a Puritan divine, educated at Worcester, Ashby-de-la-Zouch Grammar School, and Cambridge. Became tutor in the family of the governor of Guernsey (*c.* 1595), coming under the influence of Thomas Cartwright. On returning to England he preached for a time in villages near Cambridge. In 1601 B. became a lecturer at Chatham, but was suspended for heretical teaching. A patron in Derbyshire helped him for a time; he was chosen lecturer at Christ Church, Newgate, 1605, but the bishop would not authorise him; in 1605 B. published *English Puritanisme*, supporting complete autonomy of individual congregations while strongly advocating the duty of submission to civil authority. A Latin version by Ames spread these views abroad. B. got into trouble for them, and retired for a time to Derbyshire. Among his numerous publications are: *Humble Motives for Association to Maintain Religion Established*, 1601; *A Consideration of Certaine Positions Archiepiscopall*, 1604; *A Protestation of the King's Supremacie: made in the name of the Afflicted Ministers*, 1605; *A Marriage Feast*, 1620; *An Exposition of the Nintieth Psalm, and a Sermon*, 1621; and a collection of tracts, *Several Treatises of Worship and Ceremonies*, 1660. Many were published anonymously. *See* Browne's *Hist. of Congregationalism in Norfolk and Suffolk*, 1877; Gataker's Life in Clark's *Martyrology*, 1677; Neal's *History of the Puritans*, i. and ii., 1759; Barclay's *Inner Life of the Religious Societies of the Commonwealth*, 1876.

Bradwardine, Thomas (*c.* 1290-1349), Archbishop of Canterbury in the reign of Edward III., was so learned that he was known as the 'Doctor Profundus.' A native of Sussex, he was educated at Merton College, Oxford, where he rose to be Doctor and Professor of Divinity, and Chancellor of the University. He became famous as an eloquent lecturer and powerful writer, especially against Pelagianism; he was also a renowned mathematician. Having attracted royal notice, he was made chancellor of the London diocese and chaplain to Edward III., whom he accompanied during the Crecy campaign and the siege of Calais. Returning to England he was made Prebendary and then Archdeacon of Lincoln, and the 1349 Archbishop of Canterbury, but died of the 'Black Death' a few weeks later.

Brady, Nicholas (1659-1726), poet and divine. He was born at Bandon in Cork, and educated at Westminster School and Christ Church, Oxford. He took orders, and was instrumental during the Protestant revolution in preventing his native town from being burnt. He was a staunch upholder of the revolution. Later he settled in London, where he held several livings, and here also he died. His most famous work was his versification of the Psalms, which he did with the collaboration of Nahum Tate. T[illegible] was authorised in 1696. He wr[illegible] other poetry, a tragedy called *Rape, or the Innocent Impostors*, [illegible] a blank verse translation of *Æneid*. Both of these latter works have long since been forgotten.

Bradycardia, abnormal slowness of the heart-beat. [illegible] symptom of St[illegible] and may be due [illegible] the walls of the [illegible] arteries or to [illegible] muscular fibres [illegible] traction from th[illegible] tricle. Slowness of heart-beat is also met with in jaundice, melancholia, and certain toxic conditions.

Bradypus, or **Ai**, is the three-toed sloth, an edentate mammal of the family Bradypodidæ. It inhabits the forests of S. America. *See* SLOTH.

Braemar, a dist. lying along the R. Dee, Aberdeenshire, among the Grampians. It contains large deer forests, and sev. fine castles and mansions, the chief being Balmoral and Abergeldie Castles, and other royal residences. There are no towns; the largest vils. are Braemar and Crathie. In this dist. the rebellion of 1715 broke out under the Earl of Mar.

Brag, a game of cards, the interest of which depends on the ability of the player to 'brag' as to the contents of his hand. It is usually played for stakes. It resembles 'post and pair,' a bastard form of prime or poker.

Braga (Rom. *Bracara Augusta*), the third city of Portugal, N.E. of Oporto, has been successively Rom., Gothic, Moorish, Spanish, and Portuguese. Its archbishop is primate of Portugal. The cathedral, palace, and city are mediæval in appearance, and contain many interesting antiquities. B. has manufs. of fire-arms, jewellery, and cutlery, and is the centre of a cattle-breeding and dairy-farming dist. Pop. 25,000.

Braga, Theophile (*b.* 1843), Portuguese statesman, philosopher, historian, and man of letters, and the first president of the Portuguese Republic. He was born in the island of St. Michel (Azores) and educated at the university of Coimbra, at which place he subsequently became head of a literary school. Later, in 1872, he was appointed professor of literature in Lisbon. Early in life Senhor B. (whose philosophy was that of Auguste Comte, *i.e.* Positivist) entered the political arena, and by virtu[illegible] [illegible]bility soon [illegible] [illegible]lican party [illegible]cted the [illegible] [illegible]y in Lisbo[illegible] [illegible]eing joine[illegible] [illegible] and a portion of the garrison (led by non-[illegible]s), the rising was [illegible] public was for-[illegible] Oct. 5, young [illegible] and the new [illegible] accepted by the rest of the country. Senhor B. was declared president of the provisional government, a government which [illegible] a dictatorship for six [illegible] President B.'s adminis-[illegible]vas characterised by strong [illegible]cal action: the Jesuits were [illegible] religious associations dis-[illegible]nd clerical property con-[illegible] With the adoption of a constitution and the election of a new chamber, Senhor B. retired from public life to the sanctuary of his study, from the making of history to the writing of it. Senhor B.'s literary output has been voluminous, and includes poems, biography, and history—particularly literary history. Among his better known works are: *Visions of the Times*, *History of Portuguese Literature*, *History of Pedagogy in Portugal*, and *Luiz de Camoens and his Times*.

Bragança: 1. An episcopal city, cap. of dist. in the N.E. of Portugal. The city consists of two parts, one anct. and enclosed by walls, the other modern. It gave its name to the family of Braganza, the former rulers of Portugal, and for sev. centuries of Brazil. Prin. industry, silkworm rearing and silk manuf. Pop. of tn. 5500, of dist. 185,000. 2. In Para, Brazil; a seaport on the N.E. coast, about 100 m. E. of the Para estuary; carries on agric. trade. Pop. 18,000. 3. Tn. in the prov. of São Paulo, Brazil, centre of sugar-growing dist. Pop. 10,000.

Bragança, or Braganza, House of. This house was founded by Alphonso, a natural son of the Portuguese king, John I., in the earlier half of the 15th century, the title being derived from the city of the same name. When Portugal in 1640 threw off the Spanish yoke through a bloodless revolution, the Duke of B. became king of Portugal as John IV. In 1807 Napoleon declared the throne empty, and John VI. retired to Brazil until 1821, being succeeded in 1826 by his son Peter, the Emperor of Brazil. Peter, however, resigned the crown in

favour of his daughter Maria, with whose death in 1853 the main Portuguese branch of the house terminated.

Bragg, Braxton (1817-76), one of the leading southern generals in the American Civil War, 1861-65. He was born in N. Carolina, trained in the military academy at W. Point, and served in the Seminole and Mexican Wars, rising to the rank of lieutenant-colonel. From 1856-61 he led a civilian life in Louisiana where he was Commissioner of Public Works. When the Civil War broke out he was appointed brigadier-general, and soon after major-general, and served in the Army of the Mississippi, taking part in the Battle of Shiloh, 1862. Soon after that he was placed in command of the western army, in succession to General Beauregard, and invaded Kentucky, but was repelled by Buell. Later, he faced Rosenkranz in a long and hard-fought campaign, 1862-63, in which at one time the Northerners were in great straits, but were relieved by Grant, who defeated B. at Chattanovga, Nov. 1863. The latter was now superseded, but acted as military adviser to President Davis until late in 1864, when he took part in the campaign against Sherman, which ended in the surrender of the Southern army. After the war he was appointed chief engineer to the state of Alabama. His death occurred suddenly at Galveston, Texas.

Bragi, in Northern mythology a son of Odin and Frigga; god of wisdom, poetry, and eloquence, which after him received the name of Bragur. At festivals, horns were drunk in his honour.

Braham, John (c. 1774 - 1856), a great Eng. tenor, was born in London, of Jewish family, his real name being Abraham. He first sang in public when only thirteen years old. When his voice broke, he supported himself by pianoforte teaching, but when it returned, after two years' training under Rauzzini at Bath, he re-appeared at Drury Lane in 1796, in an opera by Storace, and was so successful that many engagements were offered him. But the desire for further experience and study took him to France and Italy, where he had a long series of triumphs, being engaged in all the prin. opera-houses. Returning home in 1801, he was received with enthusiasm, and thenceforth reigned supreme in concert, oratorio, and opera. He wrote many songs, which had no great merit, but to which his singing gave wide popularity. One of them, the *Death of Nelson*, is still well known. His singing was remarkable for intense expression; Lamb speaks of this in one of his essays (*On Imperfect Sympathies*).

Brahe, Per, Count (1602-80), Swedish soldier and statesman. At twenty-four he became chamberlain to Gustavus Adolphus, and served under him with distinction in the Polish and Ger. wars till Gustavus fell at Lützen in 1632. For the next two years B. was regent of Sweden, during the minority of Christina, and was afterwards governor-general of Finland (1637-40 and 1648-54), where he ruled with great success, introducing many valuable reforms, and founding the university of Abo. In 1660 he was again regent during the minority of Charles XI.

Brahé, Tycho (1546-1601), an eminent Danish astronomer and author of the Tychonic system of the heavenly bodies (*see* ASTRONOMY). He was born at Knudsthorp on Dec. 14, of aristocratic parentage, and educated at the university of Copenhagen. He commenced to study the law, but his interest in astronomy was raised by the total eclipse of the sun which occurred on Aug. 21, 1560, and from that time forward he devoted all his energies to the pursuit of this science, becoming the greatest practical astronomer of his day. His first noteworthy achievement was the radical correction of the Alphonsine and Prutenic tables. This was while he was at Leipzig, and at Augsburg, on the evening of Nov. 11, 1572, he discovered a new star in the constellation of Cassiopeia. It was not only a new star, but excelled in brilliancy any star in that group. The star gradually diminished in brightness, but at the time of its discovery by Tycho it was as bright as Venus. This discovery brought fame to Tycho, and after further wanderings in Germany and Switzerland, King Frederick II. of Denmark undertook the building, equipment, and maintenance of an observatory to enable Tycho to prosecute his astronomical labours. On the island of Hven, or Hoëne, was erected an 'astronomical castle,' called Uraniberg ('city of the heavens'), and an observatory was sunk in the ground named Stellberg ('city of the stars'). This was in 1576, and from that time till 1596 Tycho, under the protection of Frederick and his son, Christian IV., conducted a long series of painstaking observations, and enunciated the Tychonic system of planetary motions, a system which sought to reconcile the old Ptolemaic and new Copernican systems. While here, Tycho was visited by many notable persons, including James VI. of Scotland (afterwards James I. of England), who wrote a poem in his honour. In 1596 B., who had ever been an object of the dislike of the

majority of the members of his aristocratic caste (the knowledge-hating Danish nobles), was deprived of his appointments and of King Christian's protection, and had to abandon his loved Uraniberg. In the summer of the next year he finally left Denmark with his wife and family, and at the end of 1598, in response to the pressing invitation of the Emperor Rudolph II., he established himself and his instruments at Benateck, near Prague in Bohemia. Here he was joined by the celebrated Kepler in Feb. 1600, and they laboured together till Tycho died, Oct. 24, 1601. Among interesting items of personalia may be mentioned the fact that Tycho lost the front part of his nose in a duel with one Pasberg, a Dane, and that Tycho made himself and wore an artificial nose, hardly distinguishable from a real nasal organ. Also that his long feud with his fellow noblemen was intensified by marriage with a plebeian girl of Knudsthorp. An account of some of Tycho's work is given elsewhere (*see* ASTRONOMY). Not the least among his many claims to immortality is the fact that with his observations, and acting on his advice, Kepler discovered his great laws of astronomical motion. How thorough and accurate Tycho's observations were may be better appreciated when it is remembered that Tycho died just prior to the invention of the telescope. Tycho's pupil, Kepler, destroyed his (Tycho's) system with the data so laboriously gathered by his master.

Brahilov, *see* BRAILA.

Brahma and Brahmanism. Brahma is the supreme being of the Hindu pantheon. He has three manifestations—Brahmā, Vishnu, and Siva, but, strictly speaking, all the other gods are merely manifestations of *him, and were supposed to originate* in hi
Veda.
cows
only
were
the generative power of the whole universe. His name is derived from the root *brih*, 'to expand,' and he denotes the universally diffused substance of life and created energy. Brahman in the neuter is simple, infinite being; when it passes into actual manifested existence it is called Brahmā; when it achieves world-growth it is termed Vishnu; and when it once more returns into simple being, Siva. All the other deities are merely manifestations of the neuter, Brahman. The fundamental doctrines of the Hindu religion gather round the Brahmin caste, and Brahmanism is practically changeable as a phrase with Hinduism. But the Brahmins are recognised as the highest caste in the Hindu religion—the caste of priests of the highest rank. In its ranks ceremonial purity and social exclusiveness are regarded as first essentials. Brahmanism is not a body of theological dogmas, but an hereditary system of customary observances. *See* INDIA.



BRAHMA

Brahmanabad, a ruined city N.E. of Haidarabad, Sindh. It stood on an anct. course of the Indus, and its fortifications were 4½ m. in perimeter. Excavations have shown that everything is still *in situ*, as at Pompeii, so that probably the city was destroyed by some great catastrophe which also
'he course of the riv. Local
declare that the gods de-
to punish the wickedness
ain 'King Dolora,' whose
irs in the annals of about
nine centuries ago.

Brahmanas, second of the three grand divs. of Vedic literature, being prose commentaries describing the ritual to be observed in sacrifices and worship by Brahmans. The oldest
Chandogya Brahmana, belonging to the Samaveda; and *Satapatha Brahmana*, belonging to the White Yajurveda.

Brahmani, one of the smaller rivs. of Bengal; it flows through Chota Nagpur and Orissa into the delta of the Mahanaddi, N. of Cuttack. It is

famous in anct. Hindu mythology in connection with the story of Parásara.

Brahmans, the name given to the priests who form the first of the four great castes among the Hindus; they are the teachers of the doctrine of the Vedas.

Brahmaputra, a riv. rising on the N. side of the Himalayas, in Tibet, about 100 m. from the source of the Indus. After flowing along the N. of the range for over 800 m., during which it receives many tribs. both from N. and S., it turns southward, and after a long course through almost unknown mt. ranges, during which it has a fall of 7000 ft., it emerges into Assam. In Tibet it is generally known as the Tsan-pu, in Assam it is called the Dihong, but there is now no doubt that these are the same river, though this has been ascertained only a few years back. In Assam it is joined by large tribs., and thence flows down to the Bay of Bengal. It has a total length of 1800 m., and is navigable up to Dibrugarh, 800 miles from the sea.

Brahma Samaj, the new Atheistic Church in India, owes its origin to Raja Ram Mohun Roy, one of the greatest men India has produced. He was born in 1772 in the district of Baidwan, and mastered at an early age the Sanskrit, Arabic, and Persian languages. Having discovered the fallacies of the religious ceremonies practised by his countrymen, he impartially investigated the Hindu Shastras, the Koran, and the Bible, repudiated the polytheistic worship of the Shastras, and inculcated the reformed principles of monotheism as found in ancient Upanishads of the Vedas. He founded a society in 1816 consisting of Hindus. Texts were read and theistic hymns were chanted, but this society soon died away owing to the antagonism of the Hindus. In 1830 the raja organised a Hindu society for prayer-meetings, which may be considered as the foundation of the present B. S. The groundwork of their faith was 'The worship of the eternal and immutable Being, who is the author and preserver of the universe, but not under and by any other name, designation, or title, peculiarly used for any particular being or beings by any man or set of men whatsoever.' The basis of the new faith was the Vedas. Soon after Ram Mohun Roy set sail for England, and took up residence at Bristol, where he died in 1835. The B. S. maintained a bare existence until 1841, when Babu Debendra Nath Tagore, head of a well-known Calcutta family, devoted himself to it. He gave a printing press to the Samaj, and established a monthly journal known as the *Tattwabodhini Patrika*. About 1850 a schism took place on account of the discovery that the greater part of the Vedas was polytheistic. The advanced party had nature and intuition as the groundwork of their faith. Branch societies were founded in different parts of India, especially in Bengal, and the new church made rapid progress. Some of the articles of the B. S. creed may be tabulated as follows: 1. The book of nature and intuition supplies the basis of religious faith. 2. Although the Brahmas do not consider any book written by man as the basis of their faith, yet they do accept with respect and pleasure any religious *truth* contained in any book. 3. The Brahmas believe that the fundamental doctrines of their religion are also the basis of every true religion. 4. They believe in the existence of one supreme Being or God—a God endowed with a distinct personality, moral attributes worthy of his nature, and an intelligence befitting the Governor of the universe, and they worship Him alone. They do not believe in any one of his incarnations. 5. They believe that the religious condition of man is progressive like the other departments of his condition in this world. 6. They believe in the immortality and progressive state of the soul, and declare that there is a state of conscious existence succeeding life in this world, and supplementary to it as regards the action of the universal moral government. The B. S. Church numbers about 3000, and considerable progress is being made. There is a fine chapel in Calcutta. *See* ARYA SAMAJ.

Brahmin, or Brahman Ox, is *Bos indicus*, a variety of the ordinary ox of the family Bovidæ, which is known also as the zebu and Indian ox. It is distinguished chiefly by the fatty hump on its back and by its slender legs. It occurs throughout Asia and in E. Africa, and by the Hindus is regarded as sacred to Siva.

Brahms, Johannes (1833-97), a Ger. composer, was born in Hamburg, and received his first music lessons from his father, studying afterwards under Marxsen of Altona. He appeared in public as a pianist at the age of fifteen, but continued his studies and composition without ceasing until 1853, when he went on a concert tour with Remenyi, the Hungarian violinist. During this tour he made the acquaintance of Joachim, who recognising his genius became his friend, and gave him letters of introduction to Liszt and Schumann, who both appreciated his work, the latter proclaiming him to be 'the coming composer,' although up to that time he had pub. few important works. In 1854 he was made

director of the court concerts and choral society at Lippe-Detmold; this appointment he held for four years, with plenty of leisure for study and composition. In Jan., 1859, at the Leipzig Gewandhaus, he produced his piano concerto in D minor, a work so new and opposed to convention that at first it was a failure, but, played by Clara Schumann and others, it gradually won favour throughout Germany. In 1860 B. went to Winterthur, and in 1862 to Vienna, which became his permanent residence. He died there in April, 1897. Though his music was thoroughly classical in spirit, yet its form and treatment were so individual and presented so many new and difficult problems that he was not ger understood or appreciated for years; his songs especially were unvocal, and in England were almost unknown. Now every singer of any pretensions introduces B. into his programme. He refused to write opera, the nearest approach to it being his cantata *Rinaldo*. Only two of his leading compositions were inspired from without—the *Deutsches Requiem* by the death of his mother in 1865, and the *Triumphlied* by the German victories of 1870-71. Many of his works were produced in pairs having some resemblance in form and expression; this is shown especially in his 1st and 2nd, and 3rd and 4th Symphonies. His numbered works amount to 122, and the collections and studies without opus-number fill several more volumes.

Brahui, one of the races of Baluchistan. The Bs. are generally regarded as aboriginals, and they certainly occupied the country before the Baluchis, who have driven them into the mts., where they now live a nomadic life. Their language seems to contain many Hindu words.

Braid, James, Scottish surgeon. He was born at Fife in in medicine was burgh. On the studies he practised as a surgeon in Manchester till his death in March, 1850. His reputation depends upon his work in connection with animal magnetism, a branch of study which then went under the name of hypnotism.

Braidwood, a tn. in New South Wales, Australia, situated in the co. of St. Vincent. It is 50 m. S. from Goulburn.

Braidwood, Thomas (1715-1806), the first British teacher of the deaf and dumb in this country. He was a Scotsman, and was educated at Edinburgh University. He became a school teacher, and in 1760 opened at Edinburgh a school for the deaf and dumb, following the system of Dr. John Wallis. His school was successful, but was regarded very much as a curiosity rather than an educational reform. It was visited in 1773 by Dr. Johnson. B. later came to London, where he died.

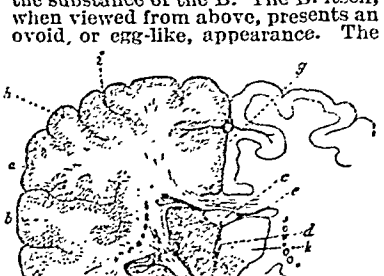
Braila, or Brahilov, the chief port (sea and river), for Southern Roumania, situated on the l. b. of the Danube, 11 m. S.S.W. of Galatz, and connected by rail with Bucharest (142 m. S.W.). Trades in corn and other products. Has a Gk. cathedral. The Russians burned B. in 1711. Its docks are newly built. Pop. 58,740.

Braille Type, *see* BLIND.

Brailov, Braila, or Ibraila is a port on the l. b. of the R. Danube, and one of the chief commercial ports of 's connected by rail which is about 100 exports large quantities of corn, and its docks are noteworthy on account of their size. Pop. about 59,000.

Brain, that part of the nervous system which is enclosed within the cranium. The nervous system of the human body may be divided into two parts: (1) The lymphatic nervous system, consisting of a chain of ganglia or collections of nervous matter bound together by nervous cords and placed on either side of the vertebral column; (2) the cerebro-spinal nervous system, consisting of the B. and the spinal cord, which are continuous with each other. The systems are connected intimately with each other and together serve to co-ordinate the various parts of the body into a harmonious whole, all the functions of every part, whether exercised consciously or not, being dependent upon the proper action of the nervous system. Th stances, and gre chiefly made up of *nerve fibres* and the latter of *nerve-cells*, which give rise to nerve fibre. Both kinds of matter lie in a matrix called the *neuroglia*, which therefore constitutes the supporting tissue of the B. matter. Nerve fibres are the conducting elements of the nervous system; the fibre consists of an axis-cylinder which is in many cases coated more or less thickly by a fatty substance called *myelin*. The nerve-cells of the grey matter consist of protoplasmic nuclei from which certain processes proceed. The axis-cylinder process is in reality a nerve fibre, and the dendrites, or protoplasmic processes, branch out into a complexity of filaments, growing more and more attenuated as they proceed away from the nerve-cell. The B. is surrounded by three membranes or meninges termed the *dura mater*, the *arachnoid mater*, and the *pia mater*.

The dura mater is a dense fibrous membrane which adheres to the inner surface of the skull, and serves both as a feeding membrane for the bone and as an envelope for the B. The arachnoid mater is a thin and transparent membrane, separated from the dura mater by a minute quantity of fluid and from the pia mater by a space containing the cerebro-spinal fluid. The pia mater is a delicate membrane which follows the inequalities of the B. surface, dipping into all the fissures, and carrying the finer blood-vessels which proceed into the substance of the B. The B. itself, when viewed from above, presents an ovoid, or egg-like, appearance. The



VERTICAL CROSS SECTION THROUGH THE BRAIN

a, cortex, grey matter of the cerebral hemisphere; *b*, white matter of the cerebral hemisphere; *c*, fornix; *d*, third ventricle; *e*, lateral ventricle; *f*, pons Varolii, cut obliquely and showing fibres running from it and forming the crura cerebri; *g*, median fissure; *h*, convolutions (gyri); *i*, fissures (sulci); *k*, optic thalamus.

parts then visible are the two cerebral hemispheres, separated by a groove from front to back called the *great longitudinal fissure*. Viewed from below, a short cylindrical portion at the rear communicates with the spinal cord. This is called the bulb or *medulla oblongata*, while above it but close to it is a white prominence called the *pons Varolii*. The closely-packed mass at the rear is called the *cerebellum*. *Medulla oblongata* is the continuation upwards of the spinal cord. It is about 1¼ in. long and 1 in. broad. At first its girth is the same as the cord; it becomes bilateral by shallow grooves anteriorly and posteriorly. As it thickens the anterior groove is crossed by bundles of nerves from each side, the formation being called the *decussation of the pyramids*. The groove is carried upwards to the pyramid, which expands up to the lower border of the pons Varolii, then becoming constricted as it disappears into the pons. Viewed from the side, the most prominent feature is the *olivary eminence*, about half an inch long, which marks the position of an underlying nucleus of grey matter. From behind, two swellings run parallel to the medial groove on each side. The inner one is called the *funiculus gracilis*, and the outer the *funiculus cuneatus*. The form ends in a prominence called the *clava*. The upper portion of the posterior area is occupied by the *restiform body*, a rope-like strand which links the medulla to the cerebellum. The medulla is composed of white matter on the surface and grey matter in the interior. The grey matter is, however, much broken up by fibres traversing it in all directions, thus constituting the *formatio reticularis*. The *pons Varolii* is a white prominence lying in front of the cerebellum. It consists of two parts: (1) the ventral or anterior portion, which corresponds to the pyramid of the medulla oblongata which disappears into it, and the feet of the *crura cerebri* which appear to rise out of it; (2) the dorsal portion, which represents a continuation upwards of the *formatio reticularis*. The ventral part is made up of longitudinal and transverse fibres and the dorsal portion principally of grey matter. The *cerebellum*, or little B., lies behind the pons Varolii and the medulla oblongata and below the hinder part of the cerebrum. In front and behind there are medial notches which divide the lateral hemispheres. At the bottom of the notches appear a medial lobe which is called the *vermis*. A deep horizontal fissure divides the cerebellum into an upper and a lower portion. The upper surface is divided from before backwards into the lingula, the central lobule, the culmen monticuli, the clivus monticuli, and the folium cacuminis. These divisions cross both hemispheres and the vermis. On the under surface the vermis is divided from behind forwards into the tuber valvulæ, the pyramid, the uvula, and the nodule. The hemispheres are divided from behind forwards into the postero-inferior lobule, the biventral lobule, and the tonsil or amygdala. The cerebellum consists of a central mass of white matter covered by a continuous layer of grey matter. The *cerebrum*, or great B., occupies the upper portion of the skull from front to back. It is connected with the parts that lie below by the *mesencephalon*, or mid B., about threequarters of an inch long. It consists of a dorsal part made up of the *corpora quadrigemina*, and a

ventral part composed of the *crura cerebri*, two rope-like strands, apparently emerging from the pons Varolii. In the interior is a canal called the *aqueduct of Sylvius*, leading from the fourth ventricle below to the third ventricle above. The cerebrum itself is divided from the cerebellum by a membrane called the *tentorium*. A deep longitudinal fissure divides it into two hemispheres, which are united below by a band of white matter, the *corpus callosum*. The surface of each hemisphere consists of grey matter and exhibits convolutions or *gyri*, separated from each other by depressions or *sulci*. In each hemisphere there are five lobes, the frontal, parietal, occipital, temporo-sphenoid, and central, or island of Reil. The grey matter on the outside, or *cortex*, extends to a thickness varying from 2·5 mm. to 6 mm. The interior is composed of white matter, but there are certain deposits of grey matter embedded in the basal part of each hemisphere. These are called the *corpus striatum*.

Functions of the brain.—The B. in man constitutes the main portion of the central nervous system, which acts, as it were, as an exchange, co-ordinating the different nervous impulses, translating the effects of a stimulus into action, and, as far as we know, into thought. Physiology has nothing to do with what the psychologists call consciousness, except indirectly. The ways in which ideas are formed, memories linked and stored, are the concern of psychology, and no satisfactory parallelism has yet been established between psychological phenomena and physiological facts. Sensation, however, may be translated physically as well as psychically, and a certain amount of localisation of function in the B. has been demonstrated as regards sensation and movement. The peripheral nervous system consists of threads of nervous matter which penetrate into the remote parts of the body. Some of these nerves serve to transmit impulses from their source to some central ganglion, or nervous mass, whence impulses are again sent forth to glands and muscles, resulting in secretions and movements. The nerves which carry the impulses to the central nerve-mass are called afferent nerves, and those which carry the departing impulses, efferent nerves. When these nervous messages are carried to the lower nerve centres, the result is a bodily movement which has no direct relation to the state of consciousness. That is to say, they are reflex actions, which in general operate without causing sensation. With respect to many nervous impulses, however, a change in consciousness does take place. The impulses which come from the stimulation of the highly differentiated systems of nerve endings in the organs of sight, hearing, touch, taste, etc., cause particular phenomena which are usually referred to under the psychological terms of sensation. The efferent nerves then carry away impulses which may have no obvious relation to the impulse from the periphery. That is to say, a highly complex process seems to have been gone through which, in the language of psychology, we call thought. Whatever may be the particular nature of the nervous movements interposed between a mass of incoming nervous impulses and the subsequent departing impulses, it is fairly certain that the seat of those movements is the complex mass of fibres and nerve-cells which we call the cortex of the fore-brain. When this portion of the B. has been removed from animals, it has been found that they have no power of co-ordinating movements. Certain stimuli may still bring about appropriate reactions, but they do so invariably and without any adjustment to other circumstances. Now there are certain actions which are performed as reflexes, such as coughing, sneezing, breathing, and the actions of the internal muscles. Many of these, however, can be brought under control if necessity arises, *e.g.* a cough or a sneeze may be checked. With the fore-brain removed such reflexes are not checked, but occur more regularly and certainly than under normal conditions. Many attempts have been made to connect various portions of the cortex with appropriate differences of function. One of the most interesting was the doctrine of phrenology, which sought to connect the various areas with so-called 'faculties,' such as music, love of humanity, etc. The complex nature of such 'faculties' is sufficient to condemn the hypothesis. On the other hand, experiment and observation have enabled us to connect certain areas with stimuli arriving from the eyes, the olfactory nerves, and the ear. There are also regions which seem to be intimately connected with movements of the leg, arm, tongue, mouth, neck, and body. Electrical stimuli applied to the appropriate point in the B. have been found to produce motions in the particular parts of the body associated with them. In general, it may be remarked that knowledge of the special functions of different parts of the B. is very scanty, and that though such knowledge has been of

great use in localising injuries, etc., it has thrown no particular light on the general problem of the connection between mind and matter.

Brain diseases.—These may be the result of injury or organic disease; or, on the other hand, functional disturbances, whose causes may or may not be traced to a physical source. Concussion of the B. results from a blow on the head or a fall from a height. The symptoms may range from a feeling of giddiness to complete insensibility. Vomiting accompanies a return to consciousness, and there may be subsequent disturbance of the normal functions of the B., *e.g.* lapses of memory. A severe blow may cause a fracture of the skull, and there is then danger of infection from micro-organisms as well as concussion. Tumours of the B. may occur as the result of tuberculous or syphilitic matter brought with the blood-stream, or may be cancerous in their nature. The B. is of course likely to suffer if the blood-stream is in any way abnormal. If the supply of blood is too small, syncope or fainting results. If one portion of the B. is cut off from the blood supply by plugging up of the artery or other causes, it gradually undergoes softening as a result of mal-nutrition. The general effect of a deficiency of oxygen is lassitude and feebleness, while too great a quantity of carbon dioxide produces drowsiness and eventually causes convulsions. Poisons find their way to the B. in the blood stream. Some of these are produced by disturbed secretions in some other part of the body, and result in auto-intoxication, a condition which reacts strongly upon the state of consciousness. Alcohol and other drugs produce characteristic mental phenomena, and the result of lead-poisoning on the B. is to lead to loss of memory and general mental feebleness. Micro-organisms may be carried to the B., causing delirium and meningitis, or inflammation of the B. membranes. The B. carries on its work by the aid of nutrient matter carried by the blood, and any over-stimulation or excessive exercise of its functions without proper rest and food produces weariness and headache, and may encourage or promote the development of morbid growths which will result in paralysis or mania. This excessive functioning may be supplied by worry, shock, over-work, or violent emotions, stimuli constantly repeated without adequate intervals for rest or stimuli too great in intensity.

Brain Coral, the coral which belongs to the Astræidæ species, to be found growing plentifully in the W. Indian Ocean. It grows at a very slow rate. So named from the resemblance of its form to the brains of the higher animals.

Braine-l'Alleud, a tn. in Brabant, Belgium, manufs. glass and cotton. Wellington's extreme right was posted here at the battle of Waterloo. Present pop. 8500.

Braine-le-Compte, a Belgian tn. in the prov. of Hainaut, on the Seine. It has cotton-mills, dye-works, and breweries, and specialises in the production of flax of the finest quality. Its pop. is 8176.

Brainerd, a tn. and cap. of Crow Wing co, Minnesota, United States. It is situated on the banks of the Mississippi, in the centre of the state, and at a junction of the Northern Pacific Railway.

Brainherd, David (1718-47), an American missionary, who ministered to the Indians of America. He was born at Connecticut. Educated at Yale College; he was expelled for a statement concerning the religion of one of the masters. He began his missionary duties to the Massachusetts Indians in the same year (1742). He met with the greatest success at New Jersey. He died after the publication of his *Mirabilia Dei Inter Indicos*, and *Grace Displayed*.

Braintree, a tn. of Essex, noted for its manufs. of silk, crepe, malt, and beer. It has iron foundries and extensive breweries. As a mrkt. tn. it has some reputation. There is an anct. church (St. Michael) of 1350. Its pop. is 5330.

Braintree, a tn. in the U.S.A. It is situated in Norfolk co., in the state of Massachusetts, 10 m. S.S.E. from Boston. Granite is found in the neighbourhood, and its preparation finds employment for most of the inhab. Its only other claim to note is the fact that it was the bp. of John Adams, the second president of the United States. Pop. 5500.

Braithwaite, John (1797-1870), Eng. engineer, of London. He ventilated House of Lords by air-pumps, 1820; devised the donkey engine, 1822. Next year his statue of the Duke of Kent was set up in Portland Place. B. constructed the first practical steam fire-engine, and with Ericsson built for the Stephensons the locomotive engine 'Novelty,' the first to run a mile a minute, 1829. With Vignoles he projected and laid out Eastern Counties Railway, 1836-43. He and Ericsson fitted a canal boat with screw propeller. This went from London to Manchester by means of canals, and back by the Thames. With Robertson he was joint-founder of the *Railway Times*, 1837. He became F.S.A. in 1819; M.I.C.E. in 1838. Wrote

Supplement to Capt. Sir John Ross's Narrative of a Second Voyage in Search of a North-West Passage. See *Mechanic's Magazine*, xiii., 1830, and *Minutes of Proceedings of Institution of Civil Engineers*, xxxi., 1871.

Brake, *see* BRACKEN.

Brake: 1. A well-known fern of the genus Pteris. 2. A general name for dense undergrowth. 3. The name given in various manufactures to the instrument connected with the breaking up of material, also spelled 'break.' 4. An appliance to stop or retard the motion of a body by the use of a resistance which absorbs part of the energy of the body, also spelled 'break.'

The need for contrivances for controlling the speed of machinery of all kinds has led to the invention of many kinds of Bs. Of the simpler types in common use mention may be made of the block B., the slipper B., and the band B. The block B. consists in its simplest form of a block of wood which, on being pressed against the rim of a wheel, retards its motion. In the case of the ordinary waggon the power is applied by the foot of the driver pressing on a treadle which is connected by a system of levers to the brake-block. In the case of heavier waggons, such as those attached to traction engines, the power is applied by means of a wheel and screw. The slipper B. is commonly used on heavy vehicles when descending hills, and consists of a metal skid or slipper into which one of the wheels fits, and is thus prevented from revolving. The increased friction due to the sliding of the wheel tends to arrest the motion of the vehicle. The band B. is used in the case of machines such as winches and cranes, and consists of a band passing round a circular drum [illegible] e machine. [illegible]he friction [illegible] drum re- [illegible]achine. In [illegible]ding force- is the pressure exerted by the water in a cylinder from which its escape can be regulated. This type of B. is used in elevators and other machines worked by hydraulic power. Electric Bs. are now much used on electric tramway systems. When a tramway car is [illegible] at high speed and the current [illegible] the ca[illegible] and thus produces a current which is made to excite electro-magnets to which are connected metal shoes. The metal shoes becoming magnetised are attracted to the metal rails above which they are fixed, and the friction between shoe-pieces and rails retards the motion of the car.

Railway brakes.—The high speeds attained on modern railways have necessitated the construction of extremely powerful Bs. Originally the form of B. employed was similar to that used on horsed vehicles, and consisted of wooden shoe-blocks which were pressed against the wheels of the tender by means of levers and a wheel and screw operated by the brakeman. A form of B. operated by a chain passing the whole length of the train was formerly in use, and was the first B. invented to be continuous in its action. In the case of the 'clip' B. the resistance is applied by causing the two sides of an iron clip to grip the rail.

Westinghouse brakes.—It is essential that a B. for use on a modern railway train should be continuous, automatic, and quick in action; the use of such a B. is in fact enforced by law. Unless a B. can be continuously applied throughout the length of the train collisions between the rear and front carriages will occur when the latter are suddenly brought to a stop. Moreover, it is evident that a B. which can be caused to act on the wheels of each vehicle is much more powerful than one which only operates on those of the end cars. It is necessary for the B. to be automatic in order that it may at once come into action should an accident such as the uncoupling and breaking away of a coach occur. The modern Westinghouse Bs. possess all these essential qualities. The two kinds at present in use are the Air-pressure B. and the Vacuum B. In both types the Bs. are applied by air pressure, regulated by means of a *train-pipe* which runs the whole length of the train. In the case of a coach becoming accidentally uncoupled the resulting rupture of the train-pipe causes an alteration of the air pressure, which automatically causes the Bs. to be applied. The original form of air-brake, invented in 1869 by George Westinghouse, and called the 'straight' air-brake, is not automatic in its action. The arrangement of the mechanism is as follows: A supply of compressed air is stored beneath the cab of the engine by means of an air-pump, the piston of which is connected to the piston-rod of a steam cylinder, and which can thus compress the air to any required e. The train-pipe in con- with this reservoir is an iron pipe running the whole length of the train, the junctions between the coaches being made of rubber hose. Underneath each coach is fixed a B. cylinder, into which compressed air from the train-pipe can be discharged, resulting in motion of the piston, which operates by means of levers

the B. blocks on the wheels. The engine driver operates the B. by means of a three-way cock, which communicates with the train-pipe on one side and the compressed air reservoir on the other. To apply the B. compressed air is allowed to pass

the brake-blocks to an extent under the control of the engineer operating the valve. A further turn of the three-way cock keeps the air in the B. cylinders fixed at the required pressure. The B. may be released by operating the valve so that communication is established between the train-pipe and the atmosphere. It is thus possible to keep the application of the brake-blocks well under control. The fact that this B. is not automatic in its action has led to its being superseded by an automatic type.

Westinghouse automatic air-brake.—This modification of the original appliance was invented by Westinghouse in 1879. Compressed air is stored by means of a pump on the engine at a pressure of about 80 lbs. per square inch. This reservoir is in connection with a train-pipe which is similar to that used in the 'straight' air B. Under each vehicle, however, is placed a small air reservoir and a piece of mechanism called a 'triple valve' which controls the admission of air to the B. cylinder, and it is these additions which render the B. automatic. In the triple valve is a small cylinder and piston which will be caused to move by any alteration in the pressure of the air in the train-pipe. Since the movement of this piston determines the admission of air from the storage cylinder to the B. cylinder, it will be seen that the action of the B. is affected by variations in the pressure of the air in the train-pipe. The latter is in turn regulated by the valve in the engine cab connecting with the large reservoir of compressed air. Under normal conditions the triple valve closes the communication between the B. cylinder and air reservoir, and hence keeps the B. out of action. To apply the B. the air pressure in the train-pipe is reduced by the driver at one end of the train or the guard at the other operating a valve. The reduction of pressure in the triple valve causes a motion of the small piston in

resulting in motion of the piston which operates the Bs. When the air pressure in the auxiliary air chamber has become less than that in the train-pipe the air in the B. cylinder is automatically shut in, and the pressure of the B. shoes on the wheels is sustained. It will thus be seen that the power with which the B. is applied depends upon the extent to which the pressure in the train-pipe is reduced. To release the Bs. the engineer operates a valve whereby the train-pipe is again put into communication with the main reservoir of compressed air underneath the engine cab. The increased pressure in the triple valve causes a motion of the valve-piston which results in the compressed air in the B. cylinder being allowed to escape into the atmosphere. The resulting motion of the pistons releases the B., while at the same time the air from the train-pipe is enabled to pass into the auxiliary storage chamber and to recharge it ready for another application of the Bs. Now if through the accidental breaking of a coupling or some other cause one of the junctions of the train-pipe is ruptured, the air pressure within the pipe will be reduced to atmospheric pressure, the triple valve will operate as above, and the Bs. will be automatically applied, bringing the coaches to a standstill. Moreover, if part of the apparatus becomes defective, resulting in a leakage of the compressed air, attention is at once called to this by the automatic application of the B. The triple valve has been greatly improved by a modification of its mechanism, which enables the application of the B. to be much more sudden. The *quick acting valve*, as it is called, is of great use in the case of an emergency when it is required to bring the train to a standstill in the least possible time. In this improved arrangement, when a large reduction is made in the air pressure in the train-pipe, the escaping air is vented straight into the B. chamber. The venting of the train-pipe under each coach is greatly accelerated, with the result that the brake-blocks are applied nearly simultaneously throughout the length of the train. This not only results in increased power, but also avoids the jolting caused by one part of the train slowing down before another.

Vacuum brake.—When this B. is in use a train-pipe exists as in the case of the air-pressure B., passing from the engine cab at one end of the train to the guard's van at the other. By means of an ejector or air-pump operated by the engine-driver, a vacuum of about 20 in. of mercury is obtained in the train-pipe and in

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piston-rod

is also kept a vacuum, as it is in direct communication with the vacuum

chamber and train-pipe. The B. is applied by allowing air to enter the train-pipe whereby an alteration of the pressure in the brake-cylinder results in a motion of the piston controlling the application of the B. blocks. If through an accident a breakage of the train-pipe is caused, air at atmospheric pressure is introduced which automatically causes the application of the Bs. The maintenance of the required vacuum is essential to the working of the B. For this purpose vacuum gauges registering the difference between the pressure of the air within the vacuum chambers and that of the atmosphere are fixed inside the engine cab and the guard's van. By means of the ejector the reading is never allowed to indicate less than a certain minimum number of inches of vacuum.

Brake, *a tn. in Germany belonging* to the grand duchy of Oldenberg. It was for centuries the port of Bremen, until Bremerhaven was founded. Shipbuilding is an important industry, and the chief manuf. is that of woollens.

Brakelonde, *see* JOCELIN DE BRAKELONDE.

Brama, a genus of acanthopterygious fish, belongs to the family Coryphænidæ. They are large, mackerel-like fishes, of bright colour, and are related to the *dolphins*. *B. Raii*, Ray's bream, is 1 to 2 ft. long, of deep-blue colour, with a large and forked tail. It is found chiefly in the Mediterranean, and is edible.

Bramah, Joseph (1748-1814), an English inventor and engineer. He was the son of a Yorkshire farmer, but owing to an accident was unable to work on a farm. He was apprenticed to a cabinetmaker, and later started in business on his own account. His most famous invention was that of the lock which bears his name, the patent for which was taken out in 1778. Seven years later he patented the hydraulic press, in which invention he had considerable help from one of his workmen. He designed a machine for the Bank of England which printed and numbered bank-notes. He invented a great number of other things, amongst which may be mentioned machinery for the manuf. of aerated waters, and a paper-making machine. He suggested the locomotion of ships by means of screws in 1785.

Bramah's Press, a hydraulic machine used for applying considerable pressure to material such as oil-bearing seeds, or for lifting heavy bodies to a required position. It consists essentially of a massive cylinder in which a piston or plunger works, carrying at the top a platform on which the goods to be pressed are placed; the cylinder communicates with a smaller cylinder, in which a smaller piston works by force applied by hand or a small engine. At the bottom of the small cylinder is a pipe leading to a reservoir of water, the pipe being fitted with an upwardly opening valve. The pipe connecting the two cylinders is fitted with a valve opening towards the large cylinder. When the smaller piston is moved upwards, water is drawn from the reservoir into the smaller cylinder, and when the piston is moved downwards the water is forced through the valve in the connecting pipe, being prevented from returning to the reservoir by the valve at the bottom of the small cylinder, while the valve in the connecting pipe prevents water returning from the large cylinder during the up-stroke of the small piston. Thus water is gradually forced into the large cylinder and the plunger is carried slowly upwards. Suppose the diameter of the large cylinder to be 12 in., and that of the small cylinder ¼ in., then the proportion between the two surfaces will be as 1 to 2304. The small piston will have to travel through a total distance downwards of 2304 in. to force the large plunger up 1 in., but the plunger will exert a pressure upwards 2304 times that of the pressure communicated to the small piston by the engine.

Bramante, or Brammante, Donato Lazzari (1444-1514), a celebrated architect of the Italian Renaissance period. He was born at Urbino, and at a very early age showed such a genius for drawing that he was placed under a celebrated master. He seems to have been very successful as an artist, but was drawn far more to architecture. He travelled through Lombardy examining the various art remains of the country, and executing various works at many of the towns which he visited. Drawn later to Milan, he remained there for some years, finally leaving it for Rome. Here he was almost immediately commissioned by Cardinal Caraffa to rebuild a convent, and by the cardinal he was introduced to Pope Alexander VI. He was regarded as an authority on architecture, and was frequently consulted. Julius II. employed him frequently, and gave him some of his most important works to do. His greatest work, however, was the part which he was given in the rebuilding of St. Peter's. His work, however, was hurried, as it had been when rebuilding the palace of Cancelleria, and many of his plans were altered after his death by Michael Angelo.

Bramantino (*c.* 1450-*c.* 1530), Italian painter, real name Bartolommeo Suardi, was probably born at Milan, where he studied under Foppa of Brescia, Leonardo da Vinci, and especially under Bramante (hence his nickname). When the latter left Milan in 1499, B. succeeded to his position. The Brera Gallery and some of the Milan churches contain many frescoes and other paintings by him and his school; his chief oil paintings are all sacred, the 'Holy Family' and 'Crucifixion' in the Brera Gallery, and 'The Dead Christ' in the church of San Sepolcro, being fine examples. He was not a prolific painter, and sev. of his works are lost, so that in some of the greatest collections (*e.g.* London National Gallery, and Dresden) he is not represented. He visited Rome in 1506, and executed some frescoes for Julius II., but these were afterwards replaced by some of Raphael's.

Brambanan, a region in Surakata prov., Java. It possesses many specimens of Hindu temples which are characterised by an absence of mortar in their construction. Of these edifices the most imposing is a cruciform temple whose various extensions cover an area of 500 sq. ft.

Bramber, a par. on the Adur, in the Lewes div. of Sussex, England; pop. under 285.

Bramble is a name frequently applied to that species of Rosaceæ known as *Rubus fruticosus*. *See* BLACKBERRY.

Brambling, or *Fringilla montifringilla*, is a bird related to sparrows, finches, and buntings. It greatly resembles the chaffinch, but is larger, and it inhabits many parts of Europe and Asia. It is known also as the bramble finch, or mountain finch.

Bramhall, John (1594-1663), an Irish divine, was e
College, Can
advanced in the Church, and in 1633 went to Ireland with Wentworth. He was imbued with the strength of mind of his master, and his Church policy in Ireland was on very similar lines to the policy of thorough. His church policy, in fact, destroyed the chances of the Royalists in Protestant Ulster. He crossed over to England on the outbreak of the Civil War, and after the death of the king, took refuge on the Continent. The Restoration saw him restored to favour, and he became bishop of Armagh, a see which he retained until his death.

Brampton, an anct. tn. in Cumberland. It is 9 m. E.N.E. of Carlisle, and it is noteworthy for its manuf. of check and gingham cloths. The pop. was 2494 in 1901. The remains of an early Eng. church contain an interesting crypt.

Brampton, a tn. in the co. of Derbyshire, near Chesterfield. Pop. about 6500.

Brampton, a town in Canada, situated in the co. Peel, Ontario. It is an important railway junction, and is 20 m. N.W. from Toronto.

Bramston, James Yorke (1763-1836), Catholic bishop, educated in Northamptonshire and at Cambridge. Studied at Lincoln's Inn, 1785, under Charles Butler, and publicly joined the Catholic Church, 1790. Became a theological student at the English College, Lisbon, 1792. While at Lisbon, B. was much occupied with mission-work, largely among the British in garrison. In 1802 the Catholic mission of St. George's-in-the-Fields was entrusted to him at home; he became vicar-general of the London district under Bishop Poynter, 1812. Bishop of *Usulæ in partibus infidelium*, 1823; vicar-apostolic of London district, 1827. All his life B. suffered from diesase, but he continued his work almost up to the last, and was renowned for his charity. See *Gent. Mag.*, July 1836; Brady's *Episcopal Succession*.

Bramwell, Byrom, Scotch physician of high ability, born 1847. Educated at Cheltenham College, Edinburgh Uni-
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Physicians (Edinburgh); senior ordinary physician (Edinburgh Royal Infirmary); gov. medical referee for Scotland; lecturer on principles and practice of medicine and on clinical medicine (School of the Royal Colleges, Edinburgh); lecturer on medical jurisprudence at university of Durham College of Medicine, Newcastle-on-Tyne, 1871. B. resigned general practice and appointments 1874, and those in Newcastle 1879. Among his publications are: *Atlas of Clinical Medicine; Diseases of the Spinal Cord; Lectures on Aphasia; Practical Medicine and Medical Diagnosis*, and many contributions to medical journals.

Bramwell, Sir Frederick (1818-1903), engineer, was the son of a London banker. Having gained experience as apprentice, draughtsman, and manager in an engine factory, he set up for himself in 1853 as a consulting engineer. As an advocate and expert witness in the law-courts and parliamentary committee rooms he was unsurpassed, and his services as adviser and arbitrator were in constant request. He took a leading part in many scientific societies, and was chairman of the City and Guilds Institute, and of the Inventions Exhibition, 1885. He was on the council of

the Royal Society, and in 1888 president of the British Association.

Bramwell, George William Wilshere (1808-92), Eng. judge, retired 1881, son of a banker, born in London. Soon left the banking business to study law at Lincoln's Inn and Inner Temple. Became barrister, 1838, and went the home circuit. Member of the Common Law Procedure Commission, 1850, resulting in Common Law Procedure Act. Q.C., 1851; knighted 1856; sat in Court of Exchequer till it ceased to exist, when he became judge of intermediate Court of Appeal, 1876. At his suggestion the word 'limited' was added to the titles of companies that want to limit their liability. He was partly responsible for Companies Act, 1862. Granted title Baron B., 1882. Sound law, common sense, and clear expression marked his judgments. Good examples of his decisions are: Ryder *v.* Wombwell (L.R. 3 Ex. 95); Stonor *v.* Fowle (13 App. Cas. 20). *See* Fairfield's *Life*, 1898, the best if not the only authority on B.

Bramwell, John Milne, Scotch physician, born at Perth, 1852, educated at Perth and Edinburgh University. After a year's travel he practised for some time at Goole, Yorks. Became noted after 1889 for his publications on hypnotism, and his treatment by suggestion. He married, 1875, and settled in London, 1892. Among his works are: *James Braid, Surgeon and Hypnotist; Hypnotism in the Treatment of Insanity and Allied Disorders; Hypnotic Anæsthesia; Dipsomania and its Treatment—by Suggestion; Hypnotism and Treatment by Suggestion*, 1909.

Bran, the husk of wheat and other grain. In bread manuf. the bran is separated from the fine flour, while in the preparation of brown bread it is included as an ingredient. Its composition of water 14 per cent., fibrin 15 per cent., starch 44 per cent., fat 4 per cent., liquose and cellulose 17 per cent., give it a certain nutritive value. It is also used in making cattle foods, and in cleaning goods in dyeing works. Its adoption as a poultice medium and as an internal cure for catarrh has been justified.

Bran, often alluded to as 'The Blessed,' son of Llyr, and a dignity of the Celtic underworld. His especial sphere was that of the poetical and musical arts, and he was represented as being of gigantic height. In later times he was regarded as a saint who had brought the cross from Rome to Britain, and is a striking instance of how the early church was successful in metamorphosing heathen deities into 'saints.' Hence his title of 'the Blessed.' An ancient Welsh poem states that his head was buried under the White Tower of London, the eyes looking towards France, as a spell against foreign invasion, but Arthur disdained to take advantage of magic in guarding his kingdom, and had the head exhumed.

Brancaleone d'Andalo (*d.* 1258), a Bolognese noble of the 13th century. In 1253 the Roms. were oppressed by their nobility, and they chose B. as their deliverer. He laid siege to the nobles in their own strongholds. His army was supplied by the Roman people, who gave him power to act as he pleased. He laid low 160 fortresses, put to death nobles and robbers alike, and even took away some of the pope's power.

Brancaster, a fishing vil. and par. in the N.W. div. of Norfolk; pop. under 1000.

Branchiæ, *see* GILLS.

Branchidæ, people of Asia Minor, descendants of Branchus. Also the name of their city, near Miletus, famed for its temple of Apollo Didymæus. The British Museum contains seated statues that once bordered a sacred way to the temple. Consult *Herodotus*, iii.

Branching, in botany, is divided into the dichotomous and lateral types, and by it is understood the development of similar members, *e.g.* of roots or stems. In dichotomy the growing apex merely divides into two, and each half grows independently; in lateral B. the branch occurs as an outgrowth beneath the apex. In this second form, the parent member continues to grow and sends out these lateral branches in regular order, when the B. is called *Racemose*, or *Indefinite*, or ceases to grow after producing one or more lateral branches, and these carry out the dividing process themselves, when the B. is said to be *Cymose*, or *Definite*. In stems the branches arise as buds in the axils of leaves and consequently develop laterally. The cymose B. is the more complicated: when one daughter-axis is given off at a time the B. is *uniparous* and if

[illegible] *scorpioid*, or scorpion-like. If developed always on the same side *helicoid*, or snail-like. When two daughter-axes are given off simultaneously the B. is *biparous*, while more than two makes it *multiparous*. In roots the B. is always lateral, usually racemose, but occasionally there is a cymose system. In leaves the venation shows the B.; if there is one mid-rib it is racemose, if there are sev. prin. veins it is cymose. In the B. of an inflorescence there are cymose, racemose, and mixed types,

the last including such a form as a raceme of cymes, *e.g.* lilac and horse-chestnut. The four chief types of racemose inflorescence are the *raceme* itself, the *spike*, the *umbel*, and the *capitulum*, which are described under special headings.

Branchiopoda is the name given to an order of Crustacea which have sev. pairs of swimming-feet, either leaf-like or lobed. They are usually to be found in fresh water, and never in the sea, though they occasionally inhabit salt lakes. It is divided into two groups, Phyllopoda and Cladocera.

Branchiostoma was the name given by Costa in 1834 to a curious creature he found on the Neapolitan shore. Two years later it was rediscovered by Yarrell, described in his *History of British Fishes*, and now known by the name he gave it of *amphioxus* (*q.v.*).

Branco River, a riv. in N. Brazil. It rises in the Parima Mts., joining the R. Negro after a course of 400 m.

Brancovan, Constantin (1654-1714), the most eminent member of the famous Roumanian family of B., or Brancoveanu, which originally came from Servia and was connected with the family of Branko. C. B. became Prince of Wallachia in 1689, after assisting Turkey in the Austrian War of 1690, and formed alliances with Austria and Russia. In consequence of this he was accused of treason, and deposed by Turkey in 1710, and imprisoned in the fortress of Yedi Kuleh at Constantinople, where he was tortured in an attempt to make him reveal the whereabouts of the large fortune which he was said to have concealed. In 1714 he was beheaded, together with his four sons and his friend, Enake Vacarescu. His death has been made the subject of numerous Roumanian popular ballads.

Brand, in Corn, *see* BURNT EAR.

Brand, Henry Bouverie William (1814-92), first Viscount Hampden and twenty-third Baron Dacre, became private secretary to Sir George Grey in 1846, and entered parliament in 1852 as member for Lewes, holding the seat till 1868, when he was elected for Cambridgeshire. From 1859 to 1866 he was parl. secretary to the Treasury, then Liberal whip till 1868. In 1872 he was elected Speaker without opposition, and re-elected in 1874 and 1880. The most remarkable event in his speakership was when, on Feb. 2, 1881, he closured the debate on the Coercion Bill, on his own authority, after a forty-one hours' sitting. In 1884, on his resignation, he received the title of Viscount Hampden.

Brand, Jan Hendrik, Sir (1823-88), S. African politician, born at Cape Town, son of Sir H. C. Brand, speaker of the Cape House of Assembly, and entered the law. In 1863 he became president of the Orange Free State, and was four times re-elected, in 1869, 1874, 1879, and 1886. In 1876 he visited England to attend the conference arranged by Lord Carnarvon to discuss the establishment of a S. African Confederation. B. opposed the scheme, which failed. At the beginning of the war between the Transvaal and Great Britain in 1880, B. preserved a neutral position, and acted as one of the mediators at the peace conference in 1881.

Brand, John (1744-1806), an Eng. antiquary, born in Durham. He received his education at the local grammar school, after which period he was sent to Oxford by the aid of friends. He took Holy Orders there and became rector in the city of London. In 1784 he was elected secretary of the Society of Antiquaries, a position which he held till his death. His work, *Observations on Popular Antiquities*, is a standard work.

Brande, William Thomas (1788-1866), an Eng. chemist. He was born in London, and after an education at Westminster became apprenticed to his brother, an apothecary, though chemistry had greater attractions for him. He was appointed professor of chemistry to the Society of Apothecaries in 1812 and later succeeded Sir Humphry Davy in the chair of chemistry of the University of London. He delivered about this time a course of lectures to the Board of Agriculture. A favourable reception was given his first work, *Manual of Chemistry* (1819), which was followed by a *Dictionary of Science, Literature, and Art* in 1842. He died while working at a new edition of this work, at Tunbridge Wells.

Brandenburg, a prov. of Prussia. It forms the centre of the modern monarchy. The Mark of B. from which the prov. originated did not occupy the same site, nor did it fall within the same boundaries, for the Mark of B. then included portions of Saxony and Pomerania. The province is very low and flat; at Potsdam the level above sea is a mere 15 ft. Near Silesia the country has a more undulating surface. Generally the soil is poor and consists to a large degree of sand. Only its canals and numerous rivs. prevent its classification among the barren spots of Europe. A large number of the people are employed in the industries of shipping, agriculture, and cattle rearing; they comprise a number of Fr. and Dutch natives, though by far the majority are Germans. Numerous distilleries and factories erected for the manuf. of cotton goods, woollen goods, linen,

sugar, tiles, glass, and machinery are found in various parts of the prov. The gov. of Potsdam and Frankfurt occupy the whole area, for Berlin the capital is in a separately governed quarter. The Mark of B. was united with Prussia in 1618, and in the reign of King Frederick William I. cut itself free from Poland and became Prussia
William
the peri
the Wend people, Brennabor, is situated 38 m. W.S.W. of Berlin. The tn. is in two parts, the old and the new, which are situated on different sides of the R. Havel. The castle and cathedral, of the 14th century, stand on an is. in the riv. The cathedral is noted for its remarkable crypt.
of the people are employed in manuf. of woollen and silk goods, baskets, leather, and starch. Its in 1905 was 51,251.

Brandes, Carl Eduard Cohen, Danish author, *b.* 1847, brother of Georg B. He entered Copenhagen University, 1865, taking courses in Oriental and comparative philology, studying Persian and Sanskrit especially. 1880 he was elected to
Democrats of
one of the bes
(Opposition). Both he and his brother were ardent Radicals
character sketches,
künst, 1880, and his
pilkünst, 1881, won him fame. Till 1883 B. was assistant editor of the *Morgenbladet;* from 1902 of *Politiken.* He soon showed a taste for dramatic art. Among his plays are: *Laegemidler*, 1880; *Gnyggende Grund; En Forlovelse; Et Besög; Et Brud*, 1885; *Kjaerlighed, Overmagt; Under Loven*, 1891; *Mohammed*, 1895; *Asgerd; Vera*, 1904; *Prima donna*, 1901; *Haardt imod Haardt.* The chief merit of his plays lies in the psychological analysis and delineation of character. B. was author of the novel *En Politiker*, 1889, and of *Jung Blut*, 1899, a romance which caused much discussion, leading eventually to prosecution and a fine. He also wrote a political review, *Fra '85 til '91*, expressing ultra-Radical views. He was connected with the publication of the *Nineteenth Century*, edited by Georg, 1874-5. *See* Vapereau, *Dictionnaire Universal des Contemporains*, 1893; Bricka, *Dansk Biografisk Lexikon.*

Brandes, Georg, a Danish critic of literature. He was born of a Jewish family on Feb. 4, 1842, at Copenhagen. In 1864 he graduated at the university of that tn. His first literary works, consisting of æsthetic and philosophic treatises, aroused a hostile attitude and earned him a reputation as a sceptic. This opinion was strengthened by a remarkable course of lectures, delivered to audiences of great number, and which were subsequently pub. as *The Great Tendencies of Nineteenth-Century Literature.* These lectures were delivered between the years 1872-75. Still more acrimonious became the reception of his essay on the later intellectual position of Europe, and he was made the subject of many bitter and spiteful attacks. In 1877 he produced the *Danske Dictere*, which is acknowledged to be a triumph of analytical psychology. The frenzied attacks still levelled against him by his more bitter opponents became so hostile that he was compelled to leave his native tn. for Berlin. Here, in a more
produced
877, Esaias
year, and
A change in the attitude of his native citizens was caused by a fresh series of lectures delivered on tour throughout Norway and Denmark, and he returned to Denmark in 1882. The tide of feeling had reacted so decidedly that an income of 4000 crowns was guaran-
him by his compatriots, who the condition that he should on subjects of literature. Among his publications are *Den i Frankrig* in 1882, dwig Holberg three

Branding, the practice of marking possessions by the fixing upon them of a distinctive mark; also a form of criminal punishment. The word is derived from the Teutonic briunan, to burn, and the custom is of very early date. It was accomplished by means of a hot iron. During Greek times, slaves were branded with a Δ, while in Rom. days robbers and runaway slaves were branded with an F (fugitivus). Later it was abolished upon the face and the arms and legs were branded. Till 1832 Fr. galley-slaves were branded with a T.F. (travaux forcés). In England during 1547, under the administration of the Statute of Vagabonds, gipsies and tramps were branded with a V. on the breast, while brawlers were marked with an F. (for Fraymake). The custom was not abolished till 1822. The implement used was generally a long bolt with a wooden handle, the iron being shaped at the end with the letter desired. A form of B. with cold irons became the fashion in the 18th century for persons of a higher class. Naturally the punishment was pure nominal. This of course led the way to its complete abandonment. In 1829 a form of B. was prevalent among mutinous Eng. soldiers. The letter D was tattooed

with ink or gunpowder, while those soldiers who had earned a reputation for thorough worthlessness were marked B.C. (bad character). In 1858 the British Mutiny Act ordered deserters to be marked with a D below the left armpit, an act which was repealed in 1879. See *Old Time Punishments*, W. Andrews, 1890.

Brandis, Christian August (1790-1867), a German philologist and historian of philosophy. Born at Hildesheim, he was educated at the University of Kiel. He graduated at Copenhagen in 1812. He continued his studies at Göttingen, and submitted his *Von dem Begriff der Geschichte der Philosophie* as a 'maiden' essay at Berlin in 1815. He helped in Bekker's ed. of *Aristotle*, and in 1821 became professor of philosophy at Bonn University. His other works include *Aristotelius et Theophrasti Metaphysica*, 1823, while his greatest work was a *Handbuch der Geschichte der griechisch-rom. Philos.*, 1835-66.

Brandl, Alois Leonhard, Austrian philologist and author, born at Innsbruck, 1855. He studied at Vienna University, then at Berlin under Müllenhoff and Zupitza, specialising in Old English. He came to England, 1879, studying under Sweet and Furnivall. In 1884 B. became professor of English at Prague; at Göttingen, 188[illegible] (succeeding [illegible] 1895. His chief works are: *Thomas of Erceldoune*, 1881; *S. T. Coleridge und die Englische Romantik*, 1886; *Geschichte der mittelenglischen Literatur*, 1892; *Shakspere*, 1894. Since 1896 B. has edited *Archiv für das studium der neueren Sprachen*. He also edited a new issue of Schlegel and Tieck's translation of Shakespeare, 10 vols., 1897. Published *Aus. Literature*, 1908.

Brandling, or *Lumbricus fœtidus*, an annelid with a curiously striped body, is one of the earthworms most valued by anglers.

Brandon, a mrkt. tn. of Suffolk. It is situated on the Little Ouse, and has a pop. of 2327. The tn. has a grammar school, founded in 1646, and has some trade in corn, coal, and timber. M[illegible] employed in the dr[illegible] It [illegible], and has a pop. of [illegible] position in one of the most richly cultivated parts of the dominion.

Brandon, Richard, succeeded his father, Gregory B., as public executioner, 1640. Said to have executed Charles I., Strafford, Laud, and others. Died full of remorse, 1649.

Brandram, Rosina (1846-1907), an English actress and vocalist. She made her début at the Opéra Comique, 1877, playing Lady Sangazure in *The Sorcerer*. She toured in U.S.A., and then returned to London, appearing at the Savoy Theatre in many of the Gilbert and Sullivan operas, and in other plays. She acted in *Iolanthe* (1882), *Princess Ida*, *The Mikado*, *Pinafore*, *The Yeomen of the Guard*, *The Gondoliers*, *The Pirates of Penzance*, and *Ruddigore*. She also appeared in *Mock Turtles*, *Tobacco Jars* (1889), *Captain Billy*, *Haddon Hall*, *Mirette* (1894), *The Rose of Persia* (1899), *The Emerald Isle* (1901), *Merrie England* (as Queen Elizabeth), *Little Hans Andersen* (Adelphi, 1903), and *Veronique* (Apollo, 1904).

Brandt, Enevold, Count (1738-72), a Danish politician. He was under the patronage of Struensee, who gained for him the appointment of chief warder to Christian VII. during his insanity. In this post he had great influence at court. Becoming jealous of Struensee, he formed a conspiracy against him, but was finally involved in his downfall.

Brandt, or Brant, Sebastian (1458-1521), Ger. poet and prose writer, was born at Strasburg. He studied at the university of Bâle, where he distinguished himself by his successes, and afterwards became a professor there. He returned to Strasburg to practise law in that town, and was honoured by the Emperor Maximilian in being made Count Palatine. His best known book is *Das Narrenschiff* (The Ship of Fools), pub. in 1494, one of the most famous books of the time. The idea of the book is supposed to have been suggested to B. by a ship being borne in a procession, and he used the idea to satirise all sorts of people. He pictures people in the various walks in life with different vices, and invites them to enter the ship of fools. In this book he seeks the cause and remedy of vice, and writes with the object of making men see their folly, hoping by so doing to reform them. The greatness of the book consists chiefly in the influence which it had on later times and in the powerful way in which it spread the spirit of the Reformation to countries beyond Germany. It is even said that texts were taken from it by preachers, and it is supposed to have given Erasmus the idea for his *Praise of Folly*. The book has been trans. into most of the European languages. Alexander Barclay trans. it into Eng. 1509, and Thomas Watson in 1517, under the title *The Shyppe of Fooles*.

Brandy, the spirit obtained by the distillation of grape wine. It is defined in the *British Pharmacopœia* as a spirituous liquid distilled from wine and matured by age, and containing

not less than 36½ per cent. by weight or 43½ per cent. by volume of ethyl hydroxide. The Bs. of best repute are distilled and matured in France in the districts in which the grapes are grown. These districts are situated around the town of Cognac, the name itself being a synonym for B., and comprise parts of the departments of Charente and Charente-Inférieure. The output averages about 5,000,000 gallons per annum, but is dependent on fluctuations in the wine crop. For a long period the vines of this and other districts of France suffered greatly from the attacks of the phylloxera, but increased scientific knowledge, leading to a system of replanting and hybridising, has enabled the vine-growers to cope with the disease. After the distillate has been prepared from the wine it is stored in casks of oak-wood, which imparts a brown colour to the spirit. B. used to be described as a straw-coloured liquid, but the colour is invariably deeper, a certain intensity of tint being arrived at by the addition of caramel or burnt sugar colouring to the spirit. The maturing occupies several years in the case of the finest Bs., but too long a period is disadvantageous, as the evaporation of the alcohol may result in too great weakening of the spirit. B. is seldom bottled 'straight;' most palates are suited by a blend of different vintages and districts. The blending is carried out in vats shortly before bottling, and it is the proper carrying out of this process which determines the quality associated with particular names. Some proprietory brands obtain a distinct flavour by means of flavouring essences. The composition of B. varies with the district and the character of the blend. Ethyl alcohol is usually present to the extent of from 40 to 68 per cent. by volume, the remainder being water and other alcohols. In a distillate of 100 litres of cognac, C. Ordonneau found the following by-products: Propyl alcohol, 40 gms.; butyl alcohol, 218·6 gms.; amyl alcohol, 83·8 gms.; hexyl alcohol, ·6 gm.; heptyl alcohol, 1·5 gm.; ethyl acetate, 35 gms.; ethyl propionate, lityrate, and caproate, 3 gms.; œnantic ether, 4g ms.; aldehyde, 3 gms.; and traces of acetal and amines. In 1904 many sellers of spirits were prosecuted and fined for selling under the name of B. spirits derived from potatoes, beetroot, etc., and the present position is that B. is presumed to be distillate of wine unless the contrary is stated. The effects of its misuse are not so generally felt as formerly, as its place as a popular spirit has been largely taken by whisky.

Brandywine Creek, a stream rising in Chester Co., Pennsylvania. It flows into Delaware and finally empties itself into Christiania Creek at Wilmington. A battle was fought on its banks during the American War of Independence in 1777.

Brangwyn, Frank, an Eng. painter, born at Bruges, 1867. On coming to England B. attracted the notice of William Morris by his work, and went for a time to the latter's studio. His frequent travels in the E. greatly influenced his artistic development. Rich colouring and well-balanced design mark his productions. His decorative panel, 'Modern Commerce,' is in the Royal Exchange, his 'Trade on the Beach' in the Luxembourg. Italy, Germany, America, and Australia also possess specimens of his work. B. also made designs for book-decoration, pottery, tapestry, and furniture. He became A.R.A. in 1904. Consult *The Studio*, 1898; and Shaw Sparrow's *Frank Brangwyn*, 1910.

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in front rendered speech impossible; in some cases a knife was used, so that the slightest movement caused great pain. Any woman guilty of a petty breach of the peace was marched through the streets by the beadle with the brank upon her head, making herself a subject for the insults and jeers of the populace. An iron bridle of somewhat similar design was adopted for the punishment of immorality up to 1856.

Brankovich, George, Prince of Servia from 1427, with intervals, to 1457, was driven into Hungary as a refugee by Sultan Murad II. After a period of c[illegible] pedition ag[illegible] himself, the [illegible] Janos, and Murad asked for a ten years' truce, offering excellent terms, which were accepted. But on receiving news that a Venetian fleet was about to attack Murad, the allies broke their agreement and marched S. B., fearing Moslem vengeance, sent secret intelligence to Murad, and also dissuaded Albania from joining the league. Murad consequently won the battle of Varna (Nov. 1444), Wladislas being killed and Hunyadi narrowly [illegible] lowed to keep his [illegible] a and Hungary [illegible] at variance, and [illegible] in a duel with a

Branksome is an eccles. par. in the eastern div. of Dorsetshire, England.

Brant, Joseph (1742–1807), chief of the Mohawk Indians. He assisted the British during the Indian and revolutionary wars. His energies were quite as indefatigably exerted on behalf of peace in later years. He became a zealous Christian in his later life, and trans. the Bible into Mohawk. He visited England for the purpose of raising money on behalf of the erection of the first Episcopal Church in Canada in 1786. A monument is erected to his memory at Brantford.

Brantford, a tn. of Brant Co., Ontario. The Grand R. is navigable to within 2½ m., and gives the tn. some importance as a port of entry. The tn. manufs. iron goods, stoneware, and agric. implements. Its pop. in 1907 was 20,713.

Brantôme, a tn. in dept. of Dordogne, S.W. of France, famous for abbey remains (A.D. 770); pop. (1906) 1230.

Brantôme, Pierre de Bourdeille (1540-1614), a famous French historian. He was born in Périgord, and was educated at Paris and Poitiers. He took orders, and was given several very fine benefices. He, however, had no inclination to enter the Church, and chose arms as his profession. He speedily gained for himself a great reputation as a soldier, and came into contact with many other fine soldiers during this period of religious wars in France. He travelled extensively, visiting Scotland, England, Spain, Portugal, and Morocco. During the reign of Charles IV., he fought on the side of the Catholics. An accident compelled his early retirement from the field, but not before he had to a certain extent been won over to the reforming party. He spent the remainder of his life in writing those memoirs for which his contact with so many of the leaders of the period had so fitted him. As an historian he is not altogether trustworthy, but his *Memoirs* have a fascinating style of their own, and he draws a realistic, if not very charming, picture of the profligacy and vice of the court life of the period. His works were not published until some considerable time after his death.

Bras d'Or, Lake, a gulf belonging to the Atlantic Ocean, which very nearly divides Cape Breton Is. into two parts. It is irregular in shape, and the isthmus in the S., which joins the two pieces, is just a little more than a mile in breadth.

Brasenose College, Oxford, was founded by William Smith, bishop of Lincoln, and Sir Richard Sutton of Prestbury, Cheshire, in 1509. The main front, facing Radcliffe Square and the first quadrangle, except the upper storey, date from the foundation. In the hall and chapel, 1663-6, the Gothic and Grecian styles are, curiously enough, combined. In the 12th century, however, a B. Hall existed, and in 1334 some students migrated to a house in Stamford, known as B. Hall, finding the factions in Oxford a hindrance to learning. An anct. knocker, in the shape of a nose, which was brought in 1890 from this house to the hall in Oxford, may well be the origin of the name. Supernumary fellowships have been added to the original foundation for a prin. and twelve fellows. In 1691 William Hulme made provision for twelve scholars, and for an endowment eight senior scholarships open to members already in residence. Robert Burton, author of *The Anatomy of Melancholy* and Walter Pater both graduated at this college.

Brasidas (*d.* 422 B.C.), one of the leading warriors of Sparta during the early days of the Peloponnesian War. He was born somewhere about the year 450 B.C., the exact date, however, is not known, and became prominent about the year 430 B.C. as a leader against the Athenians. He rapidly came to the front, and occupied a number of responsible offices in the state. His main ambition was to crush the power of Athens, and with this object in view he joined Perdiccas, the king of Macedonia, after having conducted a campaign in Thrace. But that he was true to his main ambition is obvious from the fact that he refused to help Perdiccas after the objects of his alliance had been fulfilled. A number of important towns were won over to his side, and when in 423 a truce was made with Athens by Sparta, B. refused to give up some of the towns he had taken, or which were claimed by the Greeks. In the same year he fought again in alliance with Perdiccas, but quarrelled with him, owing to the desertion of the Spartans by the Macedonians during one of the battles. The truce with Athens came to an end in 422, and before Amphipolis B. routed the Athenians under Cleon, but was himself killed in the battle. He was buried in Amphipolis, and became one of the heroes whose memory Sparta delighted to honour. As a warrior he was very courageous, and as a general quick in forming his plan of campaign, and equally quick in carrying it out. For the details of his career we are chiefly indebted to Thucydides, whilst some references are made to his career and exploits by Xenophon.

Brass, a tn. on the mouth of the B., in the Niger delta, S. Nigeria, said to

be named from the B. rods exchanged by early traders for oil and slaves.

Brass is a metal which is composed of copper and zinc, though the term is used now generally to include bronze. It has been known from very early times; it is mentioned in ancient Scripture history as being manufactured into instruments of music, ornaments, and various other things. In all probability these were not made from B., but from bronze, since we have no clue as to the composition of the metal. The Romans used an alloy which they called auricalchum, and this seems to have been B. Monumental brasses are the earliest traces of the use of the metal in Great Britain. In the reign of Henry VIII., the export of B. was strictly forbidden, a fact which points out that the manufacture of B. was extensively carried on in England. The former method of manufacture was that of mixing with powdered zinc ore, small quantities of copper. The mixture then was heated in large pots over a furnace. The modern process is that of mixing metallic zinc with copper, in crucibles, or in a reverberatory furnace, the copper being first reduced to a molten state, and then the zinc added, also in a melting state. When crucibles are used, there is much less waste. The molten metal is then poured from the crucibles into moulds to form ingots for remelting. The B. trade in England is carried on chiefly at Birmingham. The various processes are casting, rolling, and drawing, stamping, tube drawing and casing, and B. finishing. B. wire is used in immense quantities for the manufacture of pins, paper-maker's wire web, shoe rivets, etc. B. finishing includes dipping, burnishing, lacquering, etc. When an article in B. is made, it goes through a cleaning process in acid, and then it is dipped into a solution of nitric acid. For the process of 'burnishing,' polished steel tools are used, and then the article is washed in a weak solution of acid, after which it is dried in sawdust. When 'lacquering' is done, the work is heated, and while in this state, a coating of varnish, made of seed lac dissolved in spirit is spread over the surface of the article.

Brasses, Monumental or Sepulchral, are brass plates which are inlaid in polished stone. They are used to commemorate the deceased. They are to be found in old churches, being sometimes let into the walls, or more frequently, the floor. The figure of the dead person is usually engraved upon the metal, or, in some cases, the figure of the cross or another sacred emblem is inscribed. The coat of arms belonging to the dead, together with an inscription, are also cut in the brass. If the brass is in the form of an effigy, the coat of arms and the inscription are engraved on separate plates, let into the same slab. A metal called latten is used sometimes as a substitute for brass. The custom of laying down M. B. is certainly of great antiquity, though the exact period of its inception is unknown. They are considered by some authorities to be of French origin, but no evidence has been found to substantiate this view. At Stoke d'Abernon in Surrey is to be found the earliest English example of M. B., that commemorating Sir John d'Abernon, who died in 1277. That of Simon de Beauchamp, who died very early in the same century, which is the earliest recorded, is not extant. Many brasses undoubtedly were destroyed by the chances of war, or by the iconoclastic hands of the Puritans. Such as have escaped, apart from a purely antiquarian value, are exceedingly useful in presenting an accurate representation of the costumes of their period.

Brass Estuary, or riv., is an arm of the Niger delta, Western Africa, E. of the Nun mouth. B. city, on its banks, is in lat. 4° 35′ N., whilst the riv. itself falls into the sea at long. 6° 15′ E. The surrounding country is inhabited by energetic savages, called Brassmen after the city.

Brasseur de Bourbourg, Charles Etienne, ethnographer; priest he went to America in 1845, and was first professor in Quebec Seminary, then vicar-general at Boston (1846-48), and for the next fifteen years a missionary in Mexico and Central America. While in Guatemala he trans. the *Popol Vuh*, containing the sacred legends of the Quiché Indians; he also compiled a Quiché grammar, and wrote sev. vols. on Mexican antiquities and on Indian picture-writing.

Brassey, Thomas (1805-70), an Eng. railway contractor. Born near Chester, he was educated at the local school. He began life as a surveyor, and thus acquired the outlook and experience necessary to the calling he subsequently adopted. His railroad operations were quickly spreading all over the world. Among his chief contracts are Great Northern Railway, 1847-51, and railways in France, Italy, Canada, Australia, and India. He died at Hastings on Dec. 8, 1870, after building up the famous firm.

Brassey, Thomas, Earl, eldest son of T. B., the celebrated railway contractor. He was born at Stafford in 1836. He was educated at Rugby and afterwards at University College

Oxford. Here he graduated as B.A., obtaining honours in history. In 1866 he was called to the bar, while in 1865 he was returned to parl. as a Liberal. He devoted himself particularly to naval questions, and is the author of many reliable works upon that subject. He represented Hastings from 1868-86. He filled the position of civil lord to the admiralty from 1880-83, and till 1885 was secretary. His valuable statistical work earned him increased honour. He became president of the Institute of Naval Architects in 1893-95, and was made a lord-in-waiting in 1894. As lord warden of the Cinque Ports he officiated in 1908. Lord and Lady B. toured round the world in his yacht, the *Sunbeam*. A record of these travels was published by Lady B., who died at sea in 1887. Lord B. married again in 1890. He published *British Seamen* (1877) and the *British Navy*, the latter of which works is his best. He was created earl in 1911.

Brassica is the generic name of a number of Cruciferous plants which are found in Europe and Asia, and include several well-known British species. Many of them are cultivated, their various parts serving as food. *B. oleracea* is the cabbage, which has derived from it, *B. acephala*, Scotch kail, *B. Botrytis*, broccoli, *B. caulorapa*, Kohl-rabi, *B. cauliflora*, cauliflower. *B. bullata*, savoy cabbage, *B. gemmifera*, Brussels-sprouts. *B.* (or *Sinapis*) *nigra* is the black, *B.* (or *S.*) *alba*, the white mustard. *B. campestris* is the common turnip, and its variety *B. Napus* is the wild rape, *B. Rapa* being the wild turnip. *B. campestris oleifera* is the colza, and *B. Sinapis* the charlock, common in British corn-fields.

Brathwaite, Richard (*c.* 1588-1673), an Eng. poet. He entered Oxford University at the age of sixteen, passing thence to Cambridge. He settled later in London, and took to play-writing. He produced *The Golden Fleece* in 1611, which was a collection of poems and three further works, and a fresh vol. of poems in 1614. In the following year he wrote a collection of satirical compositions called *A Strappado for the Devil*, which followed the style of *The Abuses Whipt and Stript* of George Wither. His first marriage was followed by a period of retirement, during which he continued his literary work. He died at Richmond in Yorkshire, 1673. *Barnabee's Journal* is the only noteworthy work among his many publications.

Bratianu, Ion Constantin (1821-91), Roumanian statesman, was born at Piteschi, Walachia, and at the age of seventeen entered the army. A few years later he went to study in Paris, where he associated with advanced Liberals and brought back their ideals with him to Walachia. In 1848 he took part in the Roumanian rebellion, and was prefect of police at Bucharest under the provisional republican gov. When the rising was crushed he, with other exiles, escaped to Paris, but still continuing his republican propaganda he was in 1854 fined and imprisoned for sedition. In 1856 he returned home and took his place thenceforward as one of the Liberal leaders. He had much to do with the election of Prince Charles of Hohenzollern to the throne of Roumania in 1866, and was one of the ministry up to 1870. In 1876 he became Premier, and was thus head of affairs during the great war of 1877, in which Roumania, with the help of Russia, achieved her independence. His premiership lasted until 1888, and was marked by extensive reforms, especially in education and commercial affairs. After the return of the Conservative party to power he narrowly escaped impeachment in 1890. Besides being a statesman, B. also attained distinction as a political writer.

Bratsberg is a mountainous dist. in the southern part of Norway. It contains some very rich forest land. The ports of Kragero and Brevik are situated in the district.

Bratslav, a tn. in the valley of the Boug, S. Russia; once capital of a Polish province, became Russian in 1775. Largely inhabited by Jews. Pop. 8000.

Brattice (from A.-S. *bred*, a plank), a framework of boards, iron plates, or brickwork, built transversely in the galleries of mines, to regulate the flow of ventilation. In cases of emergency, sheets of heavy canvas, called B. cloths, are sometimes used.

Brattleboro', U.S.A., a post vil. of Windham co., Vermont. Its industries comprise the manufacture of organs, carriages, furniture, and machinery, while a large portion of the inhab. are engaged in sugar refining. Its pop. in 1900 was 5257.

Braun, Alexander (1805-77), botanist, held the chair of botany at Berlin University from 1852 to his death. His special field of research was the morphology of plants and the lower cryptograms, but he also suggested fresh classifications.

Braun, August Emile (1809-56), archæologist, a native of Gotha. He was educated at Göttingen and Munich, and journeyed to Rome in 1833. Here he became secretary to the Archæological Institute. His many works on art and mythology are of considerable value, and contain *Vorschule der Kunstmythologie*, 1854, and *Die Ruinen und Museen Korus*,

1854, which appeared in It., Ger., and Eng. His death took place at Rome.

Braun, Karl Ferdinand, Austrian physicist, born at Fulda, 1850, educated at Fulda Gymnasium, and Marburg and Berlin universities. In 1872 he graduated with a work on the vibration of chords. He has been successively professor at Marburg, Strass- [illegible] nd Tübingen, of the Physical 1895 he became professor of physics at Strassburg University, and director of the Physical Institute. His best known researches are the so-called 'B.'s cathoderay-tube' and 'the wave circuit.' This last is the basis of all arrangements for wireless telegraphy, which he improved by inventing a method allowing the sender's energy to be increased at will, and by another by which despatches can be sent into a particular direction. His calculation of the constant of gravitation, by the torsion balance method, agrees closely with that of Professor Boys. He and Hartmann constructed an apparatus for measuring the intensity of the magnetic field by a fine bismuth wire. B. showed the identity of electric waves and light. His latest works are on demonstrating metallic gratings so find as not to be within the microscope's range. In 1901 his *Drahtlose Telegraphie durch Wasser und Luft* appeared at Leipzig. In 1909 he and Marconi jointly won the Nobel Prize for Physics.

Braunau is a tn. and the cap. of a gov. dist. in Bohemia, Austria [illegible] manufs. of cloth, woollen, and c goods. Its possesses a famous dictine abbey, 1321, and a cl 1683.

Braunite, the mineral form of manganese sesquioxide, Mn_2O_3.

Braunsberg, a tn. of E. Prussia, is situated on the Passarge, 8 m. fro its mouth. It manufs. leather, felt, and machinery, while an extensive trade is carried on in yarn, timber, and grain. Its pop. in 1900 was 12,497.

Brauwer, or Brouwer, Adrian (1608-40), Dutch painter, born, according to some biographers, at Haarlem, and according to others at Oudenarde. There is a large collection of stories about the life of this artist, but most of them are of very doubtful authenticity. Many of these stories represent him as leading a very dissipated life, but they are overdrawn and exaggerated, although he did frequent taverns from which he has painted many scenes, one of which is in the Louvre. Among his pictures are: 'A Quarrel between Two Peasants,' at Dresden; and 'Spanish Soldiers playing at Dice,' at Munich.

Brava, small [illegible] pel anc Pop. 6000.

Brava, or Barawa, is a tn. in E. Africa, situated on the coast. It is the chief port from Cape Guardafui to Mombasa. It has a considerable trade with India and also Arabia.

Bravo, an interjection and a substantive, from the It. *bravo*, superlative *bravissimo* = most excellent. It means 'well done' or 'excellent.'

Bravoes were a band of people in Italy who offered their services for money. They were originally members of the Italian families of nobles, and often fought for their cause, but they degenerated into ruffians who would do anything for money.

Bravura, an Italian term applied in music to a composition, and sometimes to the class of performance. Music of the B. type is characterised by a vigorous motif with many diffi- [illegible] es. Mozart style. [illegible] r creating a he brawling scenes so common during the early days of the Reformation caused an act to be passed punishing the offender. Under this act persons so convicted, either in Ireland or England, whether clergy or laity, are liable to a fine not exceeding £5, or imprisonment not more than two months.

Brawn is a dish made with pig's head. The head is thoroughly cleansed and boiled. After that, all the bones [illegible] the whole is chopped [illegible]. It is set by means [illegible] which it has been [illegible] e placed in moulds.

Braxfield, Robert Macqueen, Lord (1722-99), a Scottish judge, was ad- [illegible] acted [illegible] diffi- '45.' Made a lord of session in 1776 with the title of Lord B., he became lord justice-clerk in 1788, and in the sedition trials of 1793-4 earned the name of 'the Jeffreys of [illegible]' When asked [illegible] a political [illegible] answer was, 'Bring me the prisoners, and I will find you the law.' Coarse and illiterate, yet keen and vigorous in intellect, he is well pictured in Stevenson's *Weir of Hermiston*.

Bray: 1. A small par. in Berkshire, near Maidenhead. It has a pop. of 2978 (1901), and is situated on the l. b. of the Thames. The church contains some valuable brasses. 2. A coastal tn. of Wicklow co., Ireland. Its beautiful surroundings have increased its importance, and it is known as the 'Irish Brighton.' It has a pop. of 7424 (1901). 3. A small

dist. of France, in the old prov. of Normandy, now included mainly in the E. div. of Seine-Inférieure, but also in the dept. of Oise. It is on a cretaceous plateau.

Bray, Anna Eliza (1790-1883) (*née* Kempe), Eng. author. She was born in London, and studied with a view to a stage career. Her marriage in 1818 with Charles Stothard prevented this. She married after her first husband's death the Rev. A. E. Bray, the vicar of Tavistock, in 1825, and on his death in 1857 she came to London, which was the scene of her death. Among her many works, comprising romance and travel, are: *The Borders of the Tamar and Tavy*, *Life of Thomas Stothard, R.A.*, and *A Peep at the Pixies*.

Bray, Sir Reginald (*d.* 1503), architect, was the son of a privy councillor of Henry VI. Henry VII. was his loyal friend, and made him a life grant of the Isle of Wight, and Carisbrook Castle. B. took part in the Battle of Blackheath, 1497, and was afterwards made a knight banneret. He built St. George's Chapel, Windsor, to which he also made generous contributions, and in which his tomb may still be seen. It seems certain that he designed the beautiful Henry VII.'s Chapel at Westminster, although he died before its completion.

Bray, Thomas (1656-1730), an Eng. divine and philanthropist. He was born in Shropshire. After being educated at Oswestry school, he went to All Souls' College, Oxford. His graduation took place there in 1678. He obtained the rectory of Sheldon in 1690, where he wrote a portion of his *Catechetical Lectures*. These lectures earned for him a wide reputation. His energies were now directed towards the institution of public libraries in England and America. Phenomenal success attended his efforts, no less than eighty in England and thirty-six in America being constructed before his death. The Society for the Promotion of Christian Knowledge developed from this scheme. He went to Maryland in 1699 as the Bishop of London's commissary, but returned in 1706 to a living at Aldgate.

Bray, Vicar of, the notorious Vicar of B. in Berkshire. He was Simon Alcyn, and was appointed vicar during the reign of Henry VIII. He maintained his position during the reigns of Edward VI., Mary, and Elizabeth by the expedient method of accommodating his religious principles to those in power. It was his aim to live and die Vicar of Bray, an ambition which he achieved. The fickle vicar is made to live through the reigns of Charles II., James II., William III., Anne, and George I. in the modern ballad *In Good King Charles's Golden Days*.

Brayley, Edward Wedlake (1773-1854), an Eng. antiquary and topographer, born in Surrey. An enameller by trade, he was librarian and secretary of the Russell Institution, 1825-54, and compiled a catalogue of it. B. was part-compiler with John Britton of *The Beauties of Wiltshire*, 1801. Its success led to the *Beauties of England and Wales*, 1801-15. They also wrote *Londoniana*, 1829, and *A History of the Tower of London*. *See* Britton's *Memoir*, 1855.

Brazil, a city in the U.S.A., situated in the co. Clay, Indiana. It is about 15 m. N.E. from Terre Haute.

Brazil, the largest state and republic in S. America, comprising ⅓th of the terrestrial surface of the globe, 2600 m. long, by 2500 broad. It extends between lat. 4° 30′ N., and 33° S., and between long. 35° and 70° W. Almost the whole of B. is in the southern hemisphere, it is nearly sixteen times as large as France, and is the fifth largest country in the world.

Geography and resources. — B. possesses one of the most magnificent riv. systems in the world. The Amazon, navigable throughout its course, traverses practically the entire country, and by means of its many affluents waters the whole state. Of the rivers the more important are the Parana, Madeira, Parnahyba, São Francisco, and Iguassu, the falls of which are the third largest in the world. The Rio Grande and the Uruguay also drain large tracts of country. It is now possible to travel 6446 m. on the river systems of B. in Brazilian steamboats. B. is a country of many mt. ranges. Half of its surface consists of an elevated plateau, the mean alt. of which is from 2000 to 3000 ft., with here and there an isolated range of mts. from 5000 to 7000 ft. high (Itataia, 9000 ft.). Towards the E. coast we find the highest summits, ranging from São Francisco on the N. to the southern part of the state of Rio Grande. The other prin. ranges are those of the Brazilian Andes, where nearly all the affluents of the Amazon have their source, and those ranges which separate the valleys of the Amazon and Orinoco. The coastal range is divided into the Serra do Mar, Serra do Orgãos, Serra da Estrella, Mantiqueira, Tingua, Espinhaco, Pyrenees, and Paraná Plateau. The resources of the republic are practically inexhaustible. Rubber, rare timbers, medicinal plants, nuts, oils, wax, coffee, sugar, cotton, cocoa, tobacco, and practically all the precious and semi-precious

metals are found or grow in comparative abundance, and it may safely be said that no country in the world is so rich in natural resources as B. There were in 1910 fifty-two rubber companies in operation with a capital of £2,000,000, and M. Plane has estimated that the output is capable of being doubled. It is only the few initiated in this country who are aware of the wonderful natural richness of B., and it may suffice to state that only a few miles from the riv. banks virgin forests teeming with valuable timber, natural drugs, and vegetable riches of ever[illegible]
awaiting the axe of [illegible]
the discovery of th[illegible]
merchant, and biologist. Fibre-producing plants are, too, one of the greatest sources of wealth in the republic, and one of the least exploited. These are chiefly employed in making sacking for the export of coffee. Canhamo, or Brazilian hemp, is a valuable plant, cultivated in the state of Rio on 1,000,000 square metres of land. Sisal and pita are also extensively grown. Unfortunately it does not pay to export any but the finest timbers by reason of heavy carriage rates. The hardness of most of the varieties renders them less acceptable to furniture makers than they were half a century ago, and mahogany may be said to have receded in commercial value. On the other hand, peroba, vinhatico, ipé, canella, piuna, and other woods are distinctly marketable, and fetch such prices as £5, £6, and £7 the cubic metre locally. The exportation of nuts is large, and that of medicinal plants, quinas (furnishing cinchona), angelica, quassia, gentian, and ipecacuanha is enormous. Agriculture is principally concerned with coffee, sugar, cotton, cocoa, and tobacco. In 1908-9 the export of coffee was 1,500,000 bags of 60 kilos each. Some 300,000 tons of sugar are produced annually, and in 1904 160,000 bales of cotton were grown. Cereals are secondary to these, but by no means unimportant. Some 30,000,000 head of stock is killed, exported, and used locally in a year, the bulk of which is utilised for canning or meat essence. The metals precious and semi-precious are found in comparative abundance, the prin. gold mines being situated in Morro Velho and Passagem in the state of Minas Geraes. The average yield is 12 grammes per ton. In spite of nearly 350 years of mining, hardly a month
passes without some new dis-
At Olho d'Aguaan alluvial
was recently discovered from which £200,000 worth of gold has been taken. In 1906 the total value of diamonds exported was £120,000. The prin. diamond fields are near Diamantina in Minas Geraes, Bagagem, Cannavieiras, and Central Bahia. Other minerals of importance found in B. are coal, agate, amethysts, asbestos, beryls, copper, graphite, jasper, iron, lead, manganese, and talc. In 1909 there were some 66 British mining companies owning properties in B., the cap. of which amounted to over £8,000,000.

Ethnography.—The ethnography of the native races may well give the ethnologist pause ere he attempts any rigid classification. These may, how-
be roughly divided into the
Arawak, Tupi-Guarani, and
,ocks, and among these we find the characteristics of the Mongolian and Proto-European elements which go to make up the American red race. Constant wandering, inter-crossing, re-grouping, and other causes have contributed to an unprecedented racial confusion. The Arawaks are widely distributed over an area extending from the R. Paraguay to the extreme N. of the S. American continent, the Tupi-Guarani occupy a ter. so vast as that between the Rs. Maroni in Fr. Guiana and the Plate to the S; the Tapuyas are found E. of the Cordilleras from the Peninsula of Goajira on the N. to the borders of Chili, whilst the Caribs extend from the Upper Xingu in the heart of B. to Cuba and Haiti in historical times. All these peoples, except where they have come into contact with civilisation, live the life of hunters, trappers, and fishers, and the majority of them dwell far from civilised communities. The religion of most of the Arawaks and Tupi centre round the figure of Jurupari, a species of forest-demon,

[illegible]

ately poisoned, tribal freemasonry being placed on a purely masculine basis. The non-aboriginal inhab. of the country are principally of Portuguese origin, but Basque, Sclavonic, Teutonic, and Syrian elements strongly predominate. The predominance of the white is only partially assured outside of the urban centres. Large numbers of Asiatic settlers, Japanese, Syrian, Chinese, assist to swell the pop. B. has an approximate pop. of 20,000,000 people, occupying an area of 5,682,415 square miles.

History.—B. was discovered by Pedro Cabral, a Portuguese navigator,
nturers soon
, over which
was appointed in
irregularities.
d Dutch made
many attempts to wrest the land from

its original colonists, but all of these were unsuccessful, and, the invaders finally rebuffed, a period of peaceful development set in. In 1699 the gold-fields of Minas Geraes were discovered, and the interiors of the states of Bahia, Goyaz, and Matto Grosso were opened up and settled by groups of adventurers called Bandeirantes, who were attracted to these regions by stories of the fabulous wealth they were said to contain. In 1808 Brazilian ports were opened to European commerce, and in 1821 a constitution was granted by the Portuguese Crown, but the Portuguese Cortez afterwards repudiated it, a step which was followed by the declaration of the independence of B. by the patriotic young prince regent, who proclaimed himself as Pedro I. In 1831 he was compelled to abdicate, and the second and last emperor came to the throne in 1843. In 1865 the Paraguayan War commenced, and was carried on until 1870, by which time the pop. of the rival state had become practically decimated. It cost upwards of £63,000,000, and many valuable lives. In 1888 slavery was abolished, and in 1889 the emperor was forced to leave B., and a

has enjoyed a season of peace and prosperity such as it has not experienced since its colonial times. In 1904 the third Pan-American congress was held in B., and did much to bind closer the bonds existing between her and her neighbours.

Government and administration.—B. consist [illegible] rovs. united in [illegible] that obtaining [illegible] mber of 205 deputies is elected triennially, and a senate of 63 members sits for nine years. Gov. is carried on by the president and six secretaries of state. The internal affairs of state may not be interfered with by the Union, and each state must provide for its own necessities, but the Union decrees duties and taxes on imports, and maintains posts and telegraphs, banks and custom houses. States may create export duties however. Interference with or aid of religion is prohibited. There are not less than four deputies for each state. Adult suffrage is the law with certain exceptions.

republican forces. The civil service is obligatory as regards marriage. Education is free.

Army and navy.—The army has now been placed on a much better footing than previously. The National Rifle Association has branches in every state, and the police force is semi-military in character. The peace footing of the army is 18,000, but all citizens from the age of twenty-one to that of forty-four are liable for service. The navy is in a high state of efficiency, the revolts of recent years notwithstanding. Its prin. object is defence of B.'s enormous coast-line. It consists of 3 Dreadnoughts, 2 coastguard ships, 2 scouts, 3 torpedo cruisers, 2 gunboats, and 13 destroyers, all of modern build. The crews are smart and active, and the officers highly trained.

Towns, etc.—In the prin. cities of B., Rio de Janeiro, Santos, Bahia, modern civilisation may be seen at its best in S. America, the police, sanitary, hospital, and other services being of the most advanced description, and equal to those of the first European cities. Living is expensive for Europeans, rents, furniture, and clothes being especially dear. There is every opening for enterprising European commercial firms. The Brazilians of the cities are cultivated, and passionately attached to literature, music, and the arts, and national expansion on these lines has been rapid. The standard of living is astonishingly high, and if the best furniture, carriages, and other luxuries are imported, the disposition exists to purchase these locally where occasion offers. The climate of Rio is now remarkably healthy, its reputation as a fever-ridden community having quite vanished since the new scheme of sanitation came into force. Emigrants are welcomed and assisted in the most practical manner, but little discrimination is made between grants of land and aid to Europeans and Asiatics, and the British immigrant would find himself treated very much in common with the Syrian and other less desirable newcomers. Large Ger. colonies exist in various parts of the country, and indeed Ger. expansion is a feature of modern Brazilian life, the Teuton having turned many of the best parts of the country into veritable national preserves. If the British commercial classes desire to have a hand in the future of Brazilian trade they should waste no time in taking steps towards the consolidation of their interests in the republic.

Literature.—Agassiz, *Journey in Brazil;* Bates, *Naturalist on the River Amazon;* Burton, *Explorations of the Highlands of Brazil;* Hutchison, *Report on Trade Conditions in Brazil,* Washington, 1906; *Handbook of Brazil,* pub. by International Bureau of the American Republics, 1891; Kidder, *Brazil and the Brazilians;* Santa Anna Nery, *Land of the Amazons; Le Brésil,* Paris, 1898; *Le*

Brésil (Bernardez), Buenos Ayres, 1908; Dias, *The Brazil of To-day*.

Brazil Cabbage, or Chou Caraïbe, is a term applied to several species of Araceæ of the genera Xanthosoma, Colocosia, and Caladium. They have edible rhizomes and the leaves are also eaten.

Brazilian Grass is the term applied to a Cuban species of Palmæ known as *Chamærops argentea*, and the adjective is therefore inaccurate. The leaves of the palm are cut into strips and used in making *chip* hats. *C. humilis*, an allied species, is the only European palm.

Brazil Nut is the seed of the fruit of a plant belonging to tropical S. America. The plant is a species of Lecythidaceæ in the genus *Bertholletia* (*q.v.*).

Brazil Wood is the name given to the heart-wo[illegible] *plants* of the g[illegible] *. crista* and *C.* [illegible]nerican species which yield a red dye.

Brazing, a process of uniting two pieces of brass or copper, or either, by means of soldering, *i.e.*, the application of a metal composition similar in its properties to 'cement.' The ingredients of the solder vary with the metals to be joined. When the process is completed the join is of extraordinary strength.

Brazos, a riv. of Texas, U.S.A. It rises in the Staked Plain and runs 950 m. in a S.E. direction, emptying itself finally in the Gulf of Mexico. It is navigable for 40 m. at all times, but at high tide for 250 miles.

Brazza, the most important of the Dalmatian Isles, in the Adriatic Sea. It is also the most thickly populated. Its area of 152 sq. m. is mountainous in character, the highest point reaching 2578 ft. There are quarries of the finest marble. The chief tn. is San Pietro. Pop. of island, 24,408.

Brazza, Pierre Paul François Camille (1852-1905), Fr. explorer and minister, the founder of the Fr. Congo, born on board ship in Rio de Janeiro harbour. During the Franco-Prussian War of 1870 he operated in the Fr. fleet. He made the famous exploration of the Ogoway in 1878, and later received from the Fr. gov. 100,000 francs for exploration in the Fr. interest in the Congo. Here he secured large tracts of land for France and estab. many stations. He returned again later and increased the work till in 1885 he had founded twenty-seven Fr. stations, of which Franceville was the chief. He was made governor of the Fr. dependency of the Congo in 1886. That post he held till 1898, when an inquiry was instituted regarding criticism of his administration. The fault was found, however, in France itself, and he was accordingly acquitted. In 1905 he organised an expedition to ascertain the truth of certain rumours of cruelty to the natives, and on the completion of his report died at Dakar.

Brčka, a tn. of Bosnia, situated on the *r. b.* of the R. Save, in the prov. of Dolnja Tuzla. It is 74 m. N.E. from Sarajeva.

Breach, a legal word connoting generally the violation of a duty imposed upon one by the terms of a written agreement or by the policy of the law. A B. of Contract is where one of two parties to a contract or actionable agreement breaks an obligation which the contract or agreement imposes upon him. The consequences of a B. of contract are that a right of action is at once conferred upon the party injured by the B., *while in some cases, e.g. in contracts* to supply a consignment of goods by instalments, the injured party is exonerated or 'discharged' from performing the rest of the obligations imposed upon him. Not every B. of contract amounts to a B. of a vital condition so as to entitle the injured party to rescind. Some Bs. are said to be merely of 'warranties,' as distinct from conditions, and entitle the injured party to sue for damages only. A B. of Covenant is where a party breaks a clause in an agreement (usually under seal) whereby the covenantor either vouches for the truth of certain facts or binds himself to perform or give something to the covenantee. B. of Promise means the B. of any promise the fulfilment of which is legally enforceable, but the phrase has become especially associated with the B. of a promise to marry. A B. of Trust means the non-fulfilment by a trustee of duties accepted by him, and imposed upon him by the terms of the trust instrument. In cases of fraudulent conversion of trust property the trustee is liable to criminal as well as civil proceedings. B. of the Peace in criminal law connotes any act producing or tending to produce a B. of the king's peace, *e.g.* murder, affray, assault, challenge to fight either by word or letter. The king's peace is a comprehensive notion by the aid of which the crown establishes a right to be a party to all criminal proceedings or pleas of the crown. It has its origin in ancient feudal times when the king was actual overlord of the realm, and an affray therein was therefore justifiably deemed to be analogous to an insult offered to a guest in a private house. Prison B. *denotes an actual breaking out of* prison as distinct from a mere escape. The consequences vary according to

the crime for which the prisoner is in custody. Pound B. is the common law offence of rescuing goods from the custody of the law after the officer of the court has impounded them upon a distress. Prosecutions seldom take place, as the landlord can recover treble damages by a civil action. B. of Arrestment in Scots law means the paying away of money in one's hands on which a legal 'arrest' has been laid, thereby manifesting a contempt for the law.

Breaching Tower, called Beffroi, was a tower figuring prominently in the sieges of ancient and mediæval days. The tower was movable and generally as high as the town walls. During siege it was brought close to the wall by means of wheels. It contained, posted at its different stages, bowmen, who were protected from the streams of boiling oil of their opponents by a covering of raw hides. Often the lower stage or 'floor' contained a battering-ram. It was popularly called a 'sow.'

Bread, a food prepared by baking flour obtained by grinding cereals as wheat, rye, millet, barley, oats, and maize, or other vegetable products, as beans, pease, tapioca, etc. Bread-making appears to have been practised from the very earliest times, as cakes of barley have been discovered in Stone Age dwellings. Baking was understood by the ancient Egyptians and Chaldeans, and it is recorded of Abraham that he commanded Sarah to make ready three measures of fine meal, knead it, and make cakes upon the hearth. The grinding of grain appears to have been one of the duties of the women-folk of ancient households. The primitive mill consisted of two cylindrical stones, the upper one revolving about an axis fixed in the centre of the lower one. A hole bored eccentrically through the *upper stone admitted the grain,* which was thus ground between the flat surfaces of the two stones. A handle fixed in the rotating stone enabled the woman to turn it round, and in the case of a large mill the work was performed by two women sitting opposite each other. Suc[illegible] referred to in [illegible] women shall be [illegible] one shall be ta[illegible] left.' The Romans established public bakehouses, from which free distributions of B. frequently took place. Throughout Europe the place of B. as the most important food-stuff has been unquestioned from the time of the Roman empire. In temperate latitudes by far the most important source of bread-flour is the grain of wheat. In more northerly latitudes, rye, oats, and barley are commonly used; maize-flour is made into cakes in parts of the United States, and millet B. is used in the southern parts of Europe. Wheat-flour consists approximately of starch, 72 per cent.; nitrogenous matter, 14 per cent.; water, 10 per cent.; *fats, 2·25* per cent.; and mineral salts, 1·75 per cent. When a larger proportion of the outer covering of the grain is milled, the relative amounts of starch, mineral matter, etc., are altered. The essential stages in the making of *ordinary B. are the making of dough,* in which the flour is wetted, salt added, and yeast introduced; the 'rising' of the dough, when the yeast multiplies in the material, giving rise to little vesicles or bubbles of carbonic acid gas; and the actual baking. The effect of yeast is to make the B. light or full of little spaces, and B. thus prepared is the chief food of civilised peoples, being in general more palatable and digestible than the closer-textured, unleavened variety. In making what is called 'aerated B.,' the carbon dioxide is first dissolved in water under pressure, and the flour mixed with the water while still subjected to pressure. The dough is ejected from the machine and is cut into loaves as it emerges; it then 'rises' owing to the liberation of bubbles of carbon dioxide in the interior. Baking powders are also used for the purpose of causing bubbles of gas in the dough. They consist of two substances such as sodium carbonate and tartaric acid, with perhaps an admixture of flour to effect a more uniform distribution. The powder is mixed with the flour, and when kneaded with water the carbonate is acted upon by the acid, with the result that carbon dioxide is liberated. As tartaric acid is frequently impure, other baking powders containing phosphoric acid or alum *and potassium bisulphate are frequently* used. In mixing the dough on a large scale a 'sponge' is first prepared. This consists of part of the flour to be used mixed with a large proportion of water and the amount of yeast required for the whole batch, together with a small quantity of salt. The sponge is allowed to ferment for from six to ten hours, and then mixed with the rest of the flour, water, and salt. The kneading which is required for the mixing of the dough is often done in a machine consisting of a trough or cylinder in which blades revolve, thus thoroughly incorporating the different materials. The baking is done in an oven consisting of a vaulted chamber about 10 ft. long, 8 ft. wide, and 2½ ft. high. The heating is effected by a furnace or by means of super-heated steam

carried in pipes on the top and bottom of the chamber. B. in Great Britain must be sold by weight, and must not be adulterated by substances specified in the Weights and Measures Act, 1889.

Breadalbane, the title assumed by *John Campbell, son of Sir John Campbell*, about the year 1677. He had played an important part in the political history of Scotland, and practically by purchase became Earl of Caithness. He was, however, compelled to relinquish this title, and was in 1681 created Earl of Breadalbane and Holland, and received also a viscountcy and four baronies in the peerage of Scotland. Although nominally of the Presbyterian faith, he helped Lauderdale, and on the accession of William III. was one of the few men of authority in Scotland. He was entrusted with the task of pacifying the Highlands, and succeeding in his object, gaining considerable wealth in the process. He was partially responsible for the Glencoe massacre, although his share in the atrocity did not become known until some considerable time later. He sat later as a representative peer in the British House of Lords after the Union, although he had not voted for the Union. Later, during the '75 he gave assurances of loyalty to both sides, and endeavoured to make as much as he possibly could out of it. He died in March 1717. He was succeeded by his second son, who became Earl of B., and who died in 1752. The third earl, the eldest son of the second, was noted as a diplomatist who occupied high positions in the diplomatic service, being ambassador to France and Russia. He was a strong supporter of Sir Robert Walpole, and died in 1782. All his sons having died before him, he was succeeded by a cousin who became marquess of B. in the English peerage. With the decease of the second marquess the marquessate became extinct, but the earldom passed again to a cousin, whose family still retain the title, and to whom the marquessate was restored in 1885.

Bread-fruit is obtained from *Artocarpus incisa*, a tropical species of Moraceæ which flourishes chiefly in the S. Sea Is. The fruit is spurious and forms a sorosis; it is roasted by the natives and eaten as bread. The Nicobar B. tree is *Pandanus odoratissimus*, a species of Pandanaceæ, [illegible] *Gardenia* [illegible] *Brosimum Alicastrum*, a tree of the order Moraceæ, which grows in tropical America and the W. Indies. This fruit is an achene and is edible when cooked. The Barbados B. is a variety of *Artocarpus incisa*, the bread-fruit (*q.v.*).

Bread-root, or prairie turnip, is the popular name given to the edible tuberous roots of *Psoralea esculenta*. The plant is leguminous, and occurs in N. America. The yam (*q.v.*) has similar roots, and both are eaten boiled or raw.

Breadth is a term applied to a picture indicating a certain effect of grandeur. If a picture possesses breadth no one detail strikes the spectator more than another, but he views the picture from a general standpoint. This effect is sometimes obtained by putting as few details as possible into a picture, a great deal being dependent upon the portraying of light and shade. It consists really in transmitting to the canvas the scene or whatever the subject may be as a whole, giving as true a representation of the original as possible. Turner's pictures are among those specially characterised by their breadth of treatment.

Bread-tree is the name given to sev. species of *Encephalartos*, an African genus of Cycadaceæ. The pith is rich in starch, and is made into meal by the Kaffirs. *E. Caffre* is known as Caffre, or Kaffir, Bread.

Break-joint (in architecture), to dispose the stones or bricks of a building so that no two joints occur immediately over each other. Also (as noun) the joint of a brick coming opposite the centre of bricks above and below. The term for such overlapping is a 'bond.' This greatly strengthens the structure.

Breakspeare, Nicholas, *see* ADRIAN IV., POPE.

Breakwater. Bs. differ from piers in their not being necessarily adapted for commerical uses. They do not therefore require to have roadways for the accommodation of traffic or parapets for keeping water or spray from passing over them. A B. therefore may be defined as a barrier erected for breaking the force of water without a harbour and producing a calm within. Natural Bs. also exist, such as the Isle of Wight, which occupies such a position as to protect Portsmouth and Southampton. Piers may also be constructed so as to serve also as Bs., but the term B. only strictly applies to a structure built solely for protection, and not for traffic. Bs. are of three classes, according to their structure: (1) Those of the first class consist of vertical structures of built masonry for arresting the onward movement of the waves. The new B. at Aberdeen and the Dover Admiralty pier are examples of this class. (2) Sloping struc-

tures of rubble stones dropped into
or timber
face each
example
of this class. (3) Composite Bs. involving both the above principles, *i.e.* they are partly vertical and partly sloping. Cherbourg B. is an example of this class.

Plymouth Harbour is one of the finest Bs. in existence. The designs are by Bennie, and it was begun in 1812 at an estimated cost of £900,000. The stone was obtained from a neighbouring quarry, transported by rail and shipped in vessels fitted with trapdoors and deposited through these in the shape of a huge mound. The mound was to be 10 ft. above low water, with a width of 30 ft. on top. The movement of the waves and constant storms, however, severely changed its shape. In 1824 about 800 yds. of the finished work was overthrown by a severe storm. After this it was raised 10 ft. higher, and the width extended to 45 ft., having a seaward slope of five to one. It was finished in 1841 at a cost of £1,500,000. The B. is a mile long, having a central portion 1000 yds. long. Two wings of 350 yds. long extend at the ends of this at a slight angle. The water space protected is about 1120 ac. The B. requires constant repair, the annual estimates being over £2500.

Holyhead B., designed by Mr. Randell, was erected for the purpose of converting Holyhead into a harbour of refuge. The stone was obtained from Holyhead Mts., and was run out upon a timber staging and dropped into the sea. The rubble reached up to the level of high water, and has assumed a seaward slope of one in twelve. The inner slope is one and a quarter to one. The B. shelters an outer roadstead of 400 ac., and an inner roadstead of 270 ac. The stone was obtained by blasting, one explosion of 21,000 lbs. of gunpowder displacing 130,000 tons of stone. The estimated cost was £1,500,000. On the death of Randell the work was continued by Sir John Hawkshaw, and was finished in 1873. On it stands a lighthouse rising to the height of 70 ft. above high water.

The Portland B. acts as a B. to the stretch of water between the coast of Dorset and the peninsula of Portland. It was begun in 1849. It is of the same engineering works as the Holyhead B., only they were conducted more easily than those of any other B. There is an abundance of stone in the neighbourhood, easily quarried, and the steep slopes afford facility of transport. The B. stretches due N. for more than 2 m., with one or two openings for the entrance and exit of ships. The work was finished in 1872, and consists of a rubble stone bank surmounted by vertical walls from the low water level.

The B. off Cherbourg is perhaps the largest and most costly ever erected. M. de Cessart proposed to the French government the erection of a B. off Cherbourg. As a beginning numbers of hollow cones formed of timber framing were to be sunk as close to one another as possible, and then filled with stones. These cones numbering about 64 and measuring 70 ft. high with a base diameter of 150 ft., were to form a nucleus to the stone B., and to prevent displacement of the stones by the action of the waves. This plan was abandoned in 1785 owing to the damage done to them during stormy weather, and the stone B. was continued without the aid of the cones. It was finished in 1853 at a cost of £2,500,000. Fortifications have been added since then upon the upper works. It is nearly 2½ m. long, 300 ft. wide at the base, and 31 ft. wide at the top. The water space included within and protected by the B. is about 2000 ac.

Dover B. has been chiefly useful as the French mail packet station. It was built up by means of solid ashlar brought from the bottom by means of the diving bell, with the interior formed of blocks of concrete. The area enclosed is about 685 ac. It cost about £3,500,000, and has been extended twice.

Alderney B. was designed for the government by James Walker in 1847. It is 4500 ft. long, but the outer portion has been abandoned owing to the difficulty of maintaining it. It was completed in 1864, and the total cost of the structure has been over £1,500,000.

The introduction of concrete made of Portland cement has in recent years modified the construction of Bs. Cement is mixed with sand, gravel, and broken stone in various proportions. Sometimes the concrete is made up into large blocks and deposited under in low water. At other times it is lowered down in large bags, which are opened under water and thus form a mound or basis upon which to work.

Bream is the name applied to many species of fishes, the fresh-water Bs. and sea Bs. being absolutely distinct. The former belong to the family Cyprinidæ, carp-like fishes, and are distinguished by their compressed abdomen and elongated anal fin. Among these are *Abramis blicca*, white B., *A. brama*, common B., *A. crysoleucas*, American shiner. The sea-Bs. constitute the family Sparidæ, which are perch-like, carnivorous

fishes, and, unlike *Abramis*, are mostly edible. Representative species are *Cantharus lincatus*, black sea-B. or old wife, *Sargus ovis*, sheep's head, and *Pagellus centrodontus*, common sea-bream or chad.



BREAM

Breast, the external part of the thorax lying between the neck and the abdomen, also applied particularly to the *mammæ* of women. The Bs. in women are accessory organs connected with the reproductive system. Each extends from about the level of the second or third to that of the sixth rib, and consists of a hemispherical projection at the summit of which is a nipple which is pierced by numerous small openings. These openings represent the ends of the lactiferous ducts, which carry fluid from the alveoli in the interior of the B. (*see* MAMMARY GLANDS). The size of the Bs. varies much in different races, and also in the same individual at different stages of life. In the young child they are small, and their growth is slow until the approach of puberty, when they increase rapidly in size. At the first pregnancy there is a still further increase in size, and the *areola*, or circular area of skin about the nipple, becomes brownish in colour. The Bs. are at their largest when the milk is most abundant, and usually become larger at each pregnancy. In men the Bs. are represented by a rudimentary structure.

Breastplate, a plate of iron or steel fastened to the chest of its wearer. It formed an important part of the war equipment of anct. times. A similar plate was fastened at the rear to protect, in a similar way, the back. Together, the two plates form a cuirass, which are worn to-day by European cuirassiers and by life guards and horse guards of England.

Breast-wheel, a water-wheel, the axis of which is almost on a level with the surface of the water driving it. The wheel is fitted with a number of flat boards instead of buckets as in an overshot wheel. The water approaches the wheel through a sluice or shuttle, adjusted to regulate the quantity admitted to act on the wheel; it then falls upon the nearest board and forces it downwards by its weight. The float-boards revolve in a channel which is so accurately fitted that the water is retained between each pair of boards as in a box until it arrives at the lowest point, where it flows away in the escape-stream.

Breastwork, in fortification, is an erection quickly built of earth, of adequate height to afford protection to the men standing below on the ground, and to enable them to fire over it. The inner surface of the B. is faced with such things as wood, sods, and other hard substances, to enable it to withstand the strain which is caused by the steep angle at which it is built. It is so built to give more cover to the resisters, by enabling them to get close up to it. The ditch which is formed, by the taking of the earth to build the B. is another advantage, as it causes some inconvenience to the attacking party.

Breath and Breathing, *see* RESPIRATION.

Breathing Pores, the orifices at the end of breathing tubes in insects. Respiration is carried on by means of the air-tubes which penetrate into all parts of the body from spiracles or pores on the surface of each segment. The spiracles are closed by valves actuated by special muscles. When the valves are closed the air is driven by the contraction of the body into the finer branches of the air-tubes.

Breccia is a rock composed of angular fragments of a pre-existing rock, or of sev. pre-existing rocks, united by a cement of mixed matter. The term is an Italian one, and the rock differs from conglomerate in the angularity of the fragments.

Brecey, a small Fr. tn. in the dept. of Manche, situated 27 m. to the S.W. of Saint-Lô.

Brechin, a tn. in Forfarshire. It is situated on the S. Esk, in a position 8½ m. W. of Montrose. Its chief manufs. are linen and paper, while breweries, distilleries, and bleaching works also carry on an extensive trade. The tn. was burned in 1645 by Montrose, and was the scene in 1303 of a famous siege by Edward I. Dr. Thomas Guthrie was born there. Pop. (1901) 8941.

Breckinridge, John Cabell (1821-75), American soldier and vice-president, was born near Lexington, Kentucky. Sev. members of the family had previously risen to prominent positions in the States. B. adopted the profession of law and practised in Frankfort, Kentucky, and later at Lexington. In 1849 he became a democratic member of the Kentucky legislature, and from 1851 to 1855 he sat in Congress. In 1856 he was elected vice-president under Buchanan. He strongly favoured the pro-slavery party, and in 1860 he was nominated

for the presidency in those interests. Lincoln, however, was elected president. He joined the Confederate forces, and was created major-general in 1862. He fought with distinction at Stone R., Newmarket, and in co-operation with Lee at Cold Harbour. Towards the end of the struggle he was appointed secretary of war to the Confederates. At the close of the war he took refuge in Europe, but in 1868 he resumed his practice of law in Kentucky.

Brecknock, or Brecon, the cap. of Brecknockshire, and a municipal bor. It is situated almost in the centre of the co., at the junction of the Honddu with the Usk, 40 m. from Swansea and 183 m. from London. The surrounding scenery is very beautiful and mountainous. Its manufs. are coarse woollen goods, hosiery, and flannel, etc. There is a fine old church of the Early Eng. style, and the ruins of a castle built in the 10th century. Mrs. Siddons was born in the neighbourhood. Pop. 5950.

Brecknockshire, a co. of S. Wales, situated between Radnor on the N., Radnor and Hereford on the E., Cardigan and Caermarthen on the W., and Monmouth and Glamorgan on the S. It is the fourth largest co. in Wales, with an area of 719 sq. m. It is extremely mountainous, with very magnificent scenery. The Black Mts. are among the loftiest heights, while the Brecknock Beacons reach nearly 3000 ft. The slope of the co. is towards the E., and the chief rivers are the Usk and the Wye, with their many feeders. The prin. geological formation is that of old red sandstone, and in the S. there is a belt of carboniferous limestone and millstone grit. To the N. of the co. there are silurian rocks. The greater part of the dist. is uncultivated; about a quarter is estimated to be tilled. The valleys, which contain rich soil, yield good crops of wheat, barley, rye, oats, peas, potatoes, and turnips; the latter and oats are specially grown in large quantities. The uplands are pastures for great numbers of sheep, ponies, and cattle, and these with pigs, wool, and dairy produce form the chief trade of the co. The manufs. are flannel and coarse woollen stuffs, etc., and leather. Mining is important, coal and iron being found in great quantities. Also limestone and fireclay are worked. There are large iron works. A branch of the L. and N.W. Railway crosses the co. in the N.W., and the Brecon and Merthyr and the Midland railways cross it in the centre and S. The Brecon Canal connects with the Bristol Channel. The climate of the co. is moist and healthy, and on the whole mild.

Breda, a tn. of Holland, situated at the confluence of the Mark and Aa (two canalised and navigable rivs.), in the prov. of Brabant. It was once strongly fortified, with the power to flood immediately the town, but now, to a great extent, the fortifications have been removed, though it is still a citadel. There is a very fine quay and an arsenal; also there is a prison, with isolated cells numbering 208. The manufs. are carpets, woollen and linen goods, leather, musical instruments, hats, soap, rope, etc. There are dye-works and breweries. B. has had an interesting history, and has undergone many sieges. It was taken by Prince Maurice of Orange in 1590, by the Spaniards in 1625, and by the Fr. in 1794-5. It was the subject of the 'Compromise of B.' in 1566, the 'Declaration of B.' in 1660, and the 'Treaty of B.' in 1667. This last was between England, Holland, France, and Denmark. Pop. 27,827.

Bredahl, Christian Hoüd (1784-1860), a Danish poet. His chief work, *Dramatic Scenes taken from an old Manuscript*, appeared in six parts from 1819 to 1833, and contain much fine and powerful writing. He also published several successful dramas.

Bredasdorp, a dist. of Cape Colony, S. Africa. The climate is fairly dry, the average rainfall being less than 20 in. The cap. of the dist. is B., which is situated 35 m. S.W. from Swellendam, and has a pop. of 1500.

Bredero, Gerbrand Adriaenssen (1585-1618), comic dramatist, was a shoemaker's son. In 1611 he dramatised a romance, entitled *Roderick and Alphonsus*. His original genius, however, first showed itself in his *Farce of the Cow*, 1612, and from that time there flowed from his pen a stream of farces, comedies, etc. In his *Jerolimo, the Spanish Brabanter*, he mocked at grandiloquence of the exiles from the S. A contemporary of Ben Jonson, he resembles him in his coarse, ready wit, but unlike him, he knew no Lat., and had no humanist sympathies. Holland knows no greater writer of comedies.

Brederode, Henry, Count of (1531-68), was born at Brussels. He was a staunch upholder of the reformed faith, and strenuously opposed the inroads of the Spanish Inquisition in the Netherlands. He drew up the document called 'The Compromise,' and his supporters were nick-named les Gueux (the Beggars). The failure of a revolt organised by him compelled him to flee to Germany, where he died.

Bredow, a suburb of Stettin, on the Oder, in the prov. of Pomerania, Prussia. It has sugar, chemical, and cement works, but it is noted for the

Vulcan ironworks, where many liners, including the *George Washington*, 1908, which has a tonnage of 27,000, have been built. Pop. over 14,000.

Bredow, Gottfried Gabriel (1773-1814), a celebrated German historian who was born at Berlin. He occupied the chair in history at the universities of Helmstadt, Frankfurt, and Breslau. He published many books during his lifetime, the most important of which are *Handbuch der alten Geschichte, Geographie und Chronologie*, 1799; *Chronik des 19 Jahrhunderts*, 1801; *Grundriss einer Geschichte der merkwürdigsten Welthändel von*, 1796-1810, 1810. He died at Breslau in Sept.

Bree, Matthias Ignatius van (1773-1839), a Flemish artist, born at Antwerp. He studied at Paris after having gained for his 'Death of Cato' the second 'prix de Rome.' In 1804 he became director of the Academy of Fine Arts at Antwerp. Among his notable works are 'The Patriotism of the Burgomaster Van der Wergt,' in the tn. hall at Leyden, and 'The Death of Rubens,' in the museum at Antwerp. He encouraged and instructed the younger painters, among whom are numbered Wappers and De Keyser.

Breech, Breechloader, *see* GUNS.

Breeches Bible is another name for the Geneva Bible. It was brought out in 1557 by the English exiles, who had fled from the Marian persecutions to Geneva. Three years later they produced a complete edition of the Bible. It is so called owing to the statement in third chapter of Genesis, that Adam and Eve took fig leaves and made themselves breeches. A sect of Puritan women took upon themselves (following this literally, as was their custom) to claim the right to wear male attire.

Breede, a river of S. Africa in the S.W. of Cape Colony. Its source is in the Warm-Bokkeveld, and its direction is S.W., then S.E. by E., where it enters the sea at Port Beaufort.

Breeding, the conscious selection for purposes of propagation of certain individuals in species of animals or plants, with a view to developing or retaining certain desired characteristics. The moment man became a cultivating animal he bc
extent a factor in the
the plants he induced tc
it was seen that certain plants were good to eat, it was obviously desirable that primitive man should make his home for the time being in a locality where food of those kinds were plentiful. The tribal instinct itself implies a certain degree of localisation, if only temporary; the destruction of noxious or useless plants, and the preservation of those expected to bring forth food, would probably represent the first attempt of man to influence natural growth in his own favour. The influence of recurring seasons and the periodic nature of the changes in plant form would of necessity be quickly realised even by a nomadic people, and as settlements became established, areas devoted to the growth of desirable plants would be preserved, either in the places where the wild plantation originally stood, or in places selected as suitable for defence against enemies. The success or failure of certain growths in the selected locality would determine the species looked upon as being worth cultivating. The desirability of avoiding over-crowding in the plantation would lead to the elimination of individuals less fitted for the purpose in view. Thus species would be evolved more useful to man than the corresponding wild species, because man had introduced a new factor in the struggle for existence; he had afforded protection to certain tendencies, repressed others, and as long as the conditions for reproduction were observed, the result would gradually be a movement in the direction of developing more pronounced characteristics of the kind favoured by man. The selection and B. of animals at first proceeded upon the same lines. The purposes for which animals were domesticated would be of course utilitarian. The dog appears to have come first as a hunting companion; oxen, horses, etc., were appreciated as beasts of burden; oxen, sheep, deer, goats, etc., as reserves of food and sources of useful material as hides, bones, horns, etc., while the use of products such as milk and birds' eggs was probably secondary to the cultivation of animals for other uses. For each of these uses particular qualities are necessary, included among which would be a certain degree of amenability to treatment by man. As in the case of plants, the process of natural selection would be modified by the elimination of individuals not possessing the required qualities in a satisfactory degree and by protection afforded to the more suitable in-
although perhaps such in-
would be unfit in the
'or existence under natural conditions. Later on, the possibility of intensifying certain qualities, and combining different qualities by suitable mating, would be realised, and a second important stage in the history of B. would be entered upon. The artificial fertilisation of the reproductive agents in plants appears to be a comparatively recent innovation, but the accidental or purposeful proximity of cultivated species would

lead to the intensification of certain characters. Among savages, therefore, we find horses bred for speed and endurance, dogs of disciplined ferocity, cows and goats with large udders, poultry of laying proclivities, and a general tendency to fat and fleshiness amongst many kinds of stock. With respect to plants, we find grains, roots, and tubers of exceptional size and palatability, and large and succulent fruits. Breeders in modern [illegible] factors than [illegible] but it may b [illegible] time, the practice of breeders is based on just such empirical observations as exemplified above. The factors taken into account by the modern breeder are the extent to which certain characteristics are transmitted to descendants, the effect of environment, as of soils on plants or pastures on stock, and the limits to which special characteristics can be developed by in-breeding. Every breeder has his own body of knowledge gained by his own experience. In the case of horticulture, it may be said that effects have been produced by the practice of principles obtained scientifically, but in the case of animals the special knowledge which each expert has of particular varieties and of their reactions with other varieties is the result of experience only. What general principles have been enunciated are probably mistaken, as that the offspring of a particular union may bear some of the characteristics of a male with whom the mother had previously mated. The results appearing to bear out that conclusion are probably due to other causes, as physiological facts are opposed to the idea of the persistence of the effects of a previous union. When the laws of heredity and variation can be formulated with some approach to definiteness and certainty, it will be possible to establish a science of breeding, with results difficult to appreciate at present. For not only will the process of variation be speeded up to much fewer generations in animals and plants, but it is foreshadowed that the human race itself may be brought under a scientific B. system. The tremendous possibilities involved would therefore seem to indicate the necessity for approaching the subject with more than ordinary circumspection. To take an impartial view, one may [illegible] he work of [illegible] have some [illegible], the knowledge of heredity and kindred subjects will have to be much extended before any general application of such doctrines can be tolerated. The facts of heredity as they are known at present are generally appreciated by breeders, but there are many phenomena which may at any time emerge from the sphere of speculation into comparative certainty. The main fact of heredity is of course that organisms tend to reproduce structures characteristic of the parent species. To go back to the beginning of the individual organism, we start with the conception of the germ-plasm, fertilised by the male element and gradually developing by the assimilation of protoplasm and by cell-division into the embryo. Characteristic structures develop before and after the individual has entered upon an independent existence, and may continue to develop up to the end of life. In all these developments a certain amount of similarity to the parent may be noted. Thus the child may not only resemble its parents in feature, colouring, height, etc., but also in details of mannerisms, voice, etc., even as far as those which may develop in extreme old age. Without deciding as to the degree to which heredity or environment is responsible for such similarities, there is sufficient evidence to suggest that in some way the germ-plasm contains all the possibilities of the after-development, including the latent qualities of succeeding generations. There is some difference of opinion as to the development of the germ-plasm. The theory associated with the name of Weismann suggests that though the germ-plasm contains all the possibilities of the new organism, in the subsequent cell-division some of the germ-plasm is retained for reproductive purposes and persists unchanged, whilst the other cells are differentiated according to the different functions they may be called upon to perform. Hertwig, on the other hand, was opposed to such idea of differentiation, submitting that the germ-plasm developed by division and subdivision, and retained its special characteristics under all circumstances of vital progress. This theory has the particular advantage that it at any rate explains the reproduction of lost parts in animals and plants, a difficulty which is not satisfactorily dealt with by the followers of Weismann. In connection with the idea of t[illegible] sm must be [illegible] of Mendel [illegible] tend to the opinion that the persistence of special characters as contributed by either parent is capable of a certain degree of mathematical handling. In a simple case it is shown that when opposing characters are mingled, the offspring may breed true to either

character, or may lead to generations where both characters are commingled. In experiments with sweet peas, a short variety was mated with a tall, producing tall seedlings. The second generation produced individuals half of which were tall and bred true, a quarter were dwarf and bred true, while the remainder were tall, breeding in the proportion of three tall to one dwarf. The general conclusion appears to show that either character may lie latent, as it were, for some generations, the probability of its recurrence, in the absence of any further sexual association with the character, diminishing with each successive generation. In all these theories of heredity it will be seen that the possibility of the inheritance of acquired characters is not admitted. Now every breeder recognises the effect of climate, pasture, etc., upon his stock, and he would probably maintain that the steady maintenance of certain conditions during the life of the individual determines the breed of subsequent generations. This is true in a sense, but it is still unnecessary to postulate the transmission of acquired characters. The breeder has selected, let us say, a species which has been found suitable for certain conditions; that is to say, one which can live and work or perform its other functions and also retain its ability to procreate. However great its efficiency in other respects, it cannot be bred if it is incapable of reproducing itself; unless we can speak of the B. of mules, etc. Amongst the individuals of the next generation there will be found some which are less suitable for the sai conditions, some which are more su able, and some of the same degree suitability as the parent stock. the tendency of the breeder will be select, *ceteris paribus*, the individuals most suited to his particular conditions, the stock will gradually improve in that direction. It is necessary to say 'other things being equal,' because there is a limit beyond which speci be further deterioratio ticularly ir Hence the necessity for cross-breeding. Acquired characters, therefore, are not inherited so much as the capacity for the offspring to acquire the same characters as the parents under the same circumstances.

Breezes, Land and Sea, are best studied in the tropics. For in hot climates they blow quite regularly, and extend a considerable distance, except when they are overpowered by more violent winds, as, for example, the monsoons. In England they are irregular, and therefore they cannot here be scientifically investigated. It is a matter of common observation that about noon a B. begins to blow landwards from the sea, and continues in that direction till sunset, whereas, near midnight, this B. is superceded by the contrary the shore sea usually The heat of over the earth to expand, and therefore to rise. This upper stratum passes away towards the sea, and thus increases the barometric pressure. This causes a current of air to flow continually towards the coast, where the pressure is lower. When the land B. sets in at night, it is to be explained by similar reasoning. This time the atmosphere over the land is cooled, and the heated strata above contract and therefore fall. The cooling takes place much more rapidly over the land than over the sea. Therefore the colder heavier air rushes out to sea to relieve the higher pressure.

Bregenz, a tn. in Austria, situated on the site of an old Rom. camp, at the eastern end of Lake Constance. It is the cap. of Vorarlberg, and is about 6 m. S.E. from Lindau by rail. The most important manuf. is that of wooden fittings for buildings, frameworks, etc. There are coal mines in the neighbourhood, and blast furnaces, also saltpetre works. B. trades in wine, fruit, corn, dairy produce, and cattle. Pop. 7750.

Brehm, Alfred Edmund (1829-84), a noted naturalist, born at Renthen- search work in botany and zoology in Africa, and travelled in Spain, Norway, Lapland, and other parts of Europe, where the fauna and flora had not yet been adequately classified. in 1863. In Aquarium at Berlin. His work entitled *Illustriertes Thierleben* will always preserve his fame as a naturalist.

Brehon Laws, the Eng. name for the laws that prevailed in Ireland till the middle of the 17th century. The correct name for the laws is the Feineachas, meaning the laws of the Feine or farmers. The appellation B. is derived from the Gaelic word *brethem*, meaning a trained judge, who administered justice to the tribe. Fragments of transcripts of these laws are preserved in Trinity College, the Royal Irish Academy, the British

Museum, and the Bodleian. These fragments are a store-house of archæological and philological treasures. The transcripts belong mainly to the 14th century, but the laws themselves go back as far as to the 3rd century (the reign of Cormac Macs Art). The language of the B. L. is the Bearla Feini—the most archaic form of the Gaelic language. The vocabulary is often hard to interpret owing to the lack of contemporary documents. The B. expounded the law at the public assemblies of the tribes. If there were sev. Bs. in the dist. the suitor chose his own B. An appeal to the assembly was permitted against the decision of the B., and if he were found to have given a false decision he was liable to a severe penalty. The B. had to study the laws for a course lasting about twenty years before he expounded them. The society among which the B. L. prevailed was based on the clan. These clans were under provincial kings, but these provincial kings swore allegiance and paid tribute to the Ard-Rig or supreme king of Ireland. The land occupied by a clan was the collective property of the clan, but part of the land was reserved for the king, nobles, and other public servants. The remainder of the land was allotted on the tithe-system to the people. The laws recognised two classes of crimes—crimes against the state and crimes against the individual. Crimes of the first class, *e.g.*, treason, were punished with the severest penalties, *i.e.*, banishment and loss of property. The offenders of the second class had to give compensation in proportion to the crime. The B. L. were the guardians of the entire social life of ancient Ireland.

Breisach, a town belonging to the grand duchy of Baden. It is situated on a hill, to the W. of the Rhine, about 13 m. W. of Freiburg. It was once an important Austrian fortress. The Fr. had possession of it sev. times, and during the Franco-German War of 1870 it was besieged.

Breisgau was a dist. in Germany between the Rhine and the Black Forest. It now forms a part of Baden. The land is fertile, and its productions are fruit, wine, corn, and flax. Timber is largely grown.

Breislak, Scipion (1748-1826), geologist, was born at Rome. He was a professor of mathematics at Ragusa and at Rome. He was closely connected in his geological work with Chaptal, Cuvier, and Fourcroy, and was appointed by Napoleon as inspector of the saltpetre works in Italy. His chief works are: *Descrizione geologica della provincia di Milano*, 1822; *Topografia fisica della Campania*, 1798; *Introduzione alla Geologia*, 1811.

Breitenfeld is a small place in Saxony, about 5 m. N. from Leipzig. It is noted as being the scene of one or two battles. Two battles were fought and gained by the Swedes in 1631 and 1642, during the Thirty Years' War. It was also the scene of a part of the Battle of Leipzig in 1813.

Breitinger, Johann Jakob (1701-76), Swiss scholar and writer, *b.* at Zurich, and became professor of Gk. and Heb. in the university there. His critical works had a great reforming influence upon Ger. literature. In this effort he was associated with Bodmer, and took part in the controversy with Gottsched. His writings include *Kritische Dichtkunst*, a critique on the art of poetry, 1740, and an edition of the Septuagint, 4 vols., 1731-2.

Breitkopf, Bernhard Christopher (1695-1777), the founder, in 1719, of the famous Ger. music-publishing firm, Breitkopf and Härtel. The firm is best known by its great editions of the complete works of the chief composers, and it has identified itself with musical progress on the Continent by its encouragement of new writers.

Breitkopf, Johann Gottlieb Emmanuel (1719-94), Ger. typographer, born in Leipzig, and educated at the university there. He entered his father's printing and publishing business, and introduced many valuable typographical improvements, obtaining clearer and more elegant letters than had hitherto been known. He wrote several books on he art, and began a *History of the Art of Printing*.

Bremen: 1. The city, cap. of the Free State of B. The city is divided by the riv. into two parts—the old tn. on the r.b. and the new tn. on the left. The old tn. is one of the most interesting relics of mediæval days. The tn. has narrow winding streets and quaint irregular houses. The anct. tn. hall is situated in the market square, and before it stands a statue of Roland, similar to those of sev. other old German tns. The statue is meant to represent 'Justice.' The right hand wields a sword, and at the feet lie a head and a hand symbolical of the power of life and death that rested with the magistrates. The wine-cellar of the tn. hall is one of the most interesting cellars in Europe, and has been immortalised by Wilhelm Hauff. The Cathedral of St. Peter, which replaced the wooden erection of Charlemagne is one of the most famous cathedrals of antiquity. The ramparts of the town have been converted into elaborate promenades. The modern commercial buildings are imposing. The chief industries of the tn. are maritime. It carries on an important trade with the United States in tobacco, cotton, and petroleum,

and is in touch with all the great markets of the world. B. first rose to be a city of importance when Charlemagne made it the seat of a bishop. It soon became a city of first maritime importance in the days of Hanseatic prosperity. In 1810 it passed into the hands of the Fr., but regained its independence in 1813. In 1815 it was admitted into the Germanic confederation. It joined the N. Ger. Confederation in 1867, and finally became part of the new Ger. Empire. Pop. (1905) 214,953. 2. A free state of the Ger. Empire, in area about 100 sq. m. The chief occupation of the inhab. is agriculture. The language spoken is chiefly Low Ger. B. has one voice in the Bundesrat, and elects one member for the Reichstag.

Bremenhaven is an out-port of Bremen, Germany, situated on the r. b. of the R. Weser, at the mouth of the Geest, about 10 m. from the sea. It is a thriving and increasing tn., with splendid port accommodation, which consists of four large docks, and six dry docks. Its exports are corn, iron and steel, glass, woollen goods, linen, etc., and its imports are colonial produce, timber, machinery, etc. Pop. 21,500.

Bremer, Fredrika (1801-65), Swedish novelist, was born at Tuorla near Abo in Finland. She was the daughter of a wealthy iron merchant, who removed to Arsta about twenty miles from Stockholm when Fredrika was four years old. Her studies seriously affected her constitution, and at the age of twenty she travelled with her family, for the sake of her health, through Germany, Switzerland, France, and Holland. About this time she began to study the poetry of Schiller, and through its influence became possessed by the idea of a literary career. In 1828 her *Sketches of Everyday Life* were pub., but her second vol. *The H. Family* was the work that first brought her fame. Her father died in 1830, and from that time she travelled and wrote as she pleased. She closely studied family life in the old and new worlds, and her books entitled *Homes of the New World* (1853) and *Life in the Old World* (1862) are the fruit of her researches. Her prin. works were trans. into Eng. by Mary Howitt. On her return to Sweden Miss B. became absorbed in questions of social reform. She was chiefly concerned with the problem of the emancipation of women. She formed societies of ladies in Stockholm for visiting prisons, relieving the distresses of the poor, and bringing assistance to orphans. Her later works are concerned with the promulgation of her views on such reforms. Interesting from a social point of view, *Bertha* (1856), *Father and Daughter* (1858), fall much below the standard of her earlier works when judged purely for their literary merits. The latest years of her life were spent at Arsta. Her best and most representative work is *The Neighbours* (1837).

Bremer Beiträge, popular shortened name of the Ger. weekly literary journal *Neue Beiträge zum Vergnügen des Verstandes und Witzes*, pub. in Bremen and Leipzig, 1745-8, by Gärtner, Schlegel, Cramer, Gellert, Rabener, and others. First three cantos of Klopstock's *Messias* appeared in it, 1748. *See* Muncker's selection in Kürschner's *Deutscher Nationalliteratur*.

Bremersdorp, a town in S. Africa, notable only for the fact that it is the seat of the resident commissioner of Swaziland.

Brendan, St., of Clonfert, an Irish hero of legend, is reputed to have been born at Tralee in Kerry in the year *484 A.D.* The historical personage of this name seems to have been an abbot of the Benedictine order; but according to mediæval legend this saint sailed across the Atlantic in search of a 'Promised Land,' and was the hero of countless adventures. Geographers long accepted St. B.'s Is. as a geographical reality, and in the maps previous to Columbus' voyage it is located near the island of Antilia. Columbus himself in his journal says that he had heard reports in regard to the situation of the is. The island was variously located by geographers until in 1759 the legend was exploded and the reported discoveries were explained as mirage. There are many versions of this voyage, perhaps the most popular legend of mediæval times. The oldest version is the *Navigatio Brendani* of the 11th century.

Brenner Pass is the lowest pass over the main Alps. It is in the Tyrol, and is in the main line from Germany to Italy. Its height is about 4500 ft., and is 12 m. in length. It is open all the year round, and has been in use from ancient times.

[illegible]

Gaulish tribes in an attack upon Rome. In 391 B.C. he defeated and practically annihilated a large Roman army. Had he then marched directly on Rome the city would have been at his mercy, but he wasted time, and the majority of the inhabitants of Rome were able to seek safety in flight. The city, defended only by the aged senators, was easily captured, but the Capitol sustained a six months' siege, being once saved only

by the geese of the Capitol. The Gauls at last consented to a ransom of 1000 pounds of gold. Whilst the gold was being weighed, the Romans complained of some unfairness, and B. immediately threw his sword into the opposite scale, exclaiming *Væ Victis* (woe to the vanquished). Camillus is alleged to have appeared at this opportune time to avenge the many insults to the Romans, but the story is probably untrue. The Gauls seem to have returned in safety to their homes, leaving Rome, plundered, sacked, and burnt, to recover her former strength, a task of some difficulty. The second B. is supposed to have led two expeditions of the Gauls into Macedonia and Thrace. We cannot be certain that he took part in the first, but he was certainly the leader in the second (279). He met with opposition at Thermopylæ, but was able to defeat the Greeks by the employment of much the same tactics as had been used by the Persians some two centuries before. Thence the Gauls advanced on Delphi, but they were beaten back from that city by the determined resistance of the citizens. Rather than return defeated, and having already been wounded, Brennus killed himself.

Brenta, a riv. in the N.E. of Italy. It rises in Lake Caldonazzo, in S. Tyrol. Its length is about 116 m., and its direction is first S., then eastward. It finally empties itself into the Adriatic Sea, at Brondolo. The old bed of the riv. was made into a canal, and is used more than the Brenta.

Brentano, Clemens (1778-1842), a Ger. poet and romance writer, was born at Ehrenbreitstein. He was the brother of Bettina von Arnim, Goethe's friend. He was of a restless, unsettled temperament, and subject at times to melancholia. He was a student for some time at Jena, but subsequently went to Heidelberg and afterwards to Berlin. In the year 1818 he became a zealous Catholic and renounced his former unsettled habits. For six years (1818-24) he lived in seclusion in the monastery of Dülmen, where the 'nun of Dülmen' revealed herself to him. After B. left the monastery, he lived at Regensburg, Frankfort, and Munich, and still clung to the Catholic faith. Towards the end of his life his melancholia developed to a critical pitch. He died at Aschaffenburg. B.'s poems are of a somewhat extravagant romantic type. Symbolism and occult expression are carried to excess. He pub. his *Satiren und poetische Spiele* in 1800, and *Godwi* (a romance) in 1802. His dramatic works show considerable dramatic power; the best are *Victoria* (1817) and *Die Gründung Prags* (1815). His short novels were extremely popular, *Geschichte von braven Kaspere und den Schönen Annere* (1838) is one of the finest things he ever wrote. His *Romanzen vom Rosenskranz* was pub. after his death and contains some of his best work.

Brentano, Ludwig Joseph (corrupted into Lujo) (*b.* 1844), a Ger. political economist, born at Aschaffenburg, in Bavaria. He belongs to the same family as the romanticist of the same name. He studied at Dublin University and also at several Ger. universities. In 1868 he travelled in England to study the conditions of labour and examine Eng. trade unionism. The fruit of these researches was his prin. work, *Die Arbeiter gilden der Gegenwart*, 1872. The work traces the evolution of the trade union from the guilds of the middle ages. He became a professor of political economy at Breslau in 1872, at Strassburg in 1882, at Vienna in 1888, at Leipzig in 1889, and at Munich in 1891. His other works include treatises on wages, on insurance for working classes, and on socialism.

Brentford, the co. tn. of Middlesex, England, about 8 m. W. from London and almost opposite Kew. The R. Brent divides the tn. and the Grand Junction Canal joins the riv., giving the tn. considerable water communication. B. has docks and waterworks, which supply W. London, breweries, distilleries, soap factories, and saw and planing mills. There are large and profitable market gardens, and a weekly market. Pop. 15,850.

Brent Goose, or *Bernicla brenta*, belongs to the family Anatidæ, and is closely related to the Barnacle Goose (*q.v.*). In colour it is black, white, and grey, and it commonly frequents British coasts. It is both carnivorous and herbivorous, and is an edible species of goose.

Brenthidæ is a family of coleopterous insects which includes many remarkable tropical beetles; the chief genus is *Brentus*. The most common colouring of the species is black, or brown, with red spots and markings. They live on plants, and the females bore into wood with their sharp mandibles.

Brenton, Sir Jahleel (1770-1844), a British admiral, born in Rhode Is. Belonged to a loyalist family which lost most of its property in the insurrection of the American colonies. He was lieutenant in the British navy at beginning of the war, and emigrated to England with his family. He went to sea (1781) with his father, and to the Chelsea 'maritime school' on the

return of peace. For a time B. served in the Swedish navy against the Russians. He was at Cape St. Vincent, in the *Barfleur*, 1797. In 1801, served as flag-captain to Saumarez in actions at Algeciras and Gibraltar. B. was wrecked off Cherbourg, 1803, and joined by his wife in prison. Exchanged (1806) for Masséna's nephew captured at Trafalgar. His most brilliant achievement was his defeat of the Franco-Neapolitan flotilla, 1810. He was made baronet, 1812; K.C.B., 1815. B. reached flag-rank 1830, and took part in philanthropic work. He was resident commissioner at the Cape, and lieutenant-governor of Greenwich Hospital, 1840. *See* Raikes's *Life*, 1846, re-issued 1855 by B.'s son.

Brentwood, a market tn. in Essex, England, situated in pleasant, well-wooded country, about 9 m. from Chelmsford. There is a large and important grammar school, which was founded by Sir Anthony Browne, and the ruins of a chapel, which had been dedicated to St. Thomas à Becket. Pop. 4975.

Brenz, Johann (1499-1570), Lutheran reformer, was born at Weil, Würtemberg. He was a student at Heidelberg and there heard Luther speak. Henceforth he became a staunch adherent of the Reformation party. In his *Syngramma Suevicum* he expounded Luther's doctrine of the Eucharist. Although he was a zealous reformer, he opposed persecutions and openly expressed his disapproval of methods of persecution in his work *De Hæreticis, an sint persequendi*, 1554. He co-operated in the Würtemberg Confession of Faith, and his catechism was second only to Luther's.

Brescia, a prov. of N. Italy. It is bordered by Bergamo on the N.W. by Tyrol on the N.E., on the S. by Cremona, and on the S.E. Mantua. It has an area estimated at 1645 sq. m. In the N. it is mountainous, but the rest of the prov. forms a part of the fertile plain of Lombardy, in which are grown the vine and olive, corn, flax, and hemp. There are also miles of orchards. B., the cap. of the prov., is beautifully situated on the banks of the rivs. Mella and Garza, at the foot of sev. hills. It is a well and regularly built town, surrounded by walls, and possessing two cathedrals. Its manufs. are important, and consist of raw silk, woollen goods, leather, wine, etc. The making of fire-arms and cutlery are specially famous. There are tanyards, paper and oil mills, and large iron works. The antiquity of the city, however, is its chief source of interest. Its fine Rom. remains, the marble temple of Vespasian, the Corinthian columns, statues, etc., are visited each year by numbers of people. Throughout the city are many old It. pictures and frescoes. There are a botanic garden, museum, public library, hospital, etc., and a great number of public fountains in streets and squares. Pop. 70,614.

Breslau, a Prussian city, and the cap. of Silesia. It is situated at the junction of the Oder with the Ohlau, about 150 m. S.E. from Frankfort on the Oder, and 190 m. from Berlin. The Oder divides the city into an old and a new tn., and these with their many suburbs are connected by a number of bridges. Until 1812 the tn. was well fortified, but the fortifications were then made into very fine promenades, while the moat was turned into an ornamental piece of water. B. is the centre of all the manufacturing dists. of the prov. Its manufs. are silk and woollen goods, linen and cotton fabrics, lace and jewellery, earthenware, soap, starch, alum, machinery, etc. There is a great trade in coal, corn, flax and hemp, timber and metals. B. is connected by railways with every important city around. Pop. 470,904.

Bressay, an island, 6 m. long and 2½ wide, belonging to the Shetlands, situated E. of Mainland. Its coast is bold and rocky, and is the home for numerous eagles. Peat moss largely covers the interior of the island. The inhab. are engaged in slate quarrying, fishing, and making kelp. Pop. 685.

Bresse was an old dist. of E. France. It was situated to the E. of the R. Saone, and its cap. was Bourg. It formed a part of the kingdom of Burgundy.

Bressuire, a tn., cap. of an arron. in the dept. of Deux-Sèvres, France. Has [illegible] (1906) 4561. [illegible] ort in the [illegible] It has a magnificent harbour, bounded by the promontory of Finistère on the N. and Kelerun on the S. The city is built on the slopes of two hills, intersecting which is the R. Penfeld; the incline is very steep, and the terraces of the tn. are exceptionally prominent. On the l. b. of the riv. is B. proper; on the right is the suburb known as Recouvrance. There is an imposing promenade called, after the constructor, the Cours d'Ajot, beautifully planted out and embellished with statues of Neptune and Abundance. On the right of the estuary of the Penfeld stands a castle of the 12th century. The castle is the only mediæval relic in the tn. The sinister ramparts, built by Vauban, are of a much later date. Among the more noteworthy modern buildings are an exchange, observatory, public library,

naval hospital, and some fine churches. The estuary of the Penfeld forms the port of the town. On both banks are shipbuilding yards, docks, gun-foundries, and marine stores. The port of commerce is divided off by the Cours d'Ajot, and is protected by a breakwater nearly a mile in length. The manufs. of the city include candles, leather, chemicals, paper. The chief exports are wheat and fruit. The roadstead is about 6 m. in length. The tn. of B. was an object of dispute between the Fr. and Eng. In 1342 it passed into the hands of the Eng., and was held by them till 1397. It was again taken by the English, but finally fell to the French through the marriage of Louis XII. to Anne of Brittany. It was Richelieu who realised its possibilities as a fortress, and commenced the fortifications in 1631.

Brest Litovsk, a Russian tn. in the gov. of Grodno. It is situated at the confluence of the R. Bug and the Mukhovetz. It was once the home of the Polish kings, and now is an Armenian bishopric. It contains a Catholic church, three Greek churches, and a synagogue for the Jews. There are military stores and magazines. Its manufs. are leather, cloth, soap, etc., and the chief articles of trade are wood, birch tar, flax and hemp, grains, etc. Pop. 46,825.

Bretagne, *see* BRITTANY.

Brethren, Plymouth, an outcome of the evangelical movement of the beginning of the 19th century. They advocated a free and simple theology, a religion stripped of all dogma and ritualism. After a very stormy career, during which they were attacked by nearly all the other sects, they encountered also troubles from within. The sect as originally established split into two sections, and although their speedy overthrow was prophesied, they still continue to exist and flourish. They have done great missionary work in Europe and India. Exact statistics of their numbers have not been obtained, but it is certain that they are a flourishing body in Europe, America, and India.

Brethren of Common Life, a community formed during the middle ages, and often wrongly described as 'Reformers before the Reformation.' They can be said to have been established by Gerard Groot about the year 1380, and included at one time in their numbers the famous Thomas à Kempis. They did not consist of a necessity of clerics, but included in their numbers many laymen. The B. were free to remain as long as they liked, or to depart when they liked. They were to remain firm as long as they remained B., to their vows of chastity, poverty, and obedience. Their money was to go to a common fund, and they were to spend their lives amongst the people, converting and teaching them. They were bitterly attacked from inside the Church, but were triumphant over their enemies at the Council of Constance. During the 16th century they began to decline, and they became extinct in the 17th. They are sometimes called the Brethren of Modern Devotion.

Brethren of the Free Spirit, a sect of mystical pantheists who sprang into existence during the 13th century. They were really the outcome of the revival of the Aristotelian movement influenced by Neoplatonism. They were bitterly attacked by the orthodox. Council after council condemned their works, and yet they continued to exist until the 16th century. They probably survived in some of the Protestant mystic sects that sprang into existence at that time.

Brétigny, a Fr. vil. in the dept. of Eure-et-Loir, 6 m. S.E. by rail from Chartres, and about 20 m. S. of Paris. It is noted as being the scene of a treaty drawn up in 1360, between England and France, by which the former power renounced all claim to the crown of France and liberated the king, John II. France allowed England still to hold a few possessions and paid a ransom of 3,000,000 crowns for their monarch.

Breton, Cape, *see* CAPE BRETON.

Bréton, Jules Adolphe (1827-1906), a Fr. painter, was born at Courrières, Pas-de-Calais, France. He studied art under de Vigne in Ghent, under Wappers at Antwerp, and under Drölling at Paris. His first pictures were historical in character, and include 'Saint Piat Preaching in Gaul and 'Misery and Despair'—a scene of the Revolution of 1848. B., however, saw that his talent lay in interpreting rural life. In 1853 he exhibited his 'Return of the Harvesters' in the Salon at Paris, and the 'Little Gleaner' at Brussels. Among his best works are 'Blessing the Fields,' 1857; 'Erecting a Calvary,' 1859; 'Women Weeding,' 1861; and 'The Fountain,' 1872.

Breton, Nicholas (*c.* 1558-1626), an Eng. poet and pamphleteer, native of Staffordshire, stepson of George Gascoigne. Studied at Oxford, and wrote pastorals, sonnets, and madrigals. The late Bishop Percy has preserved his song, *The Ballad of Phillida and Corydon*, and mentions his interlude, *An Old Man's Lesson and a Young Man's Love*. His *Passionate Shepherd* appeared 1604. *England's Helicon*, 1600, contains lyrics of his. See *Collected Works* (edited by Dr. Grosart, 1877 and 1893), and

Bullen's *Poems, chiefly lyrical, of the Elizabethan Age*, 1890.

Breton de los Herreros, Manuel (1796-1873), Spanish dramatist, born at Quel in the prov. of Logroña. He occupied several gov. offices, but lost them owing to his strong Liberal tendencies. His output was extremely great. He wrote about 160 original plays, and many translations. His genius lay chiefly in comic power. *Muérete; y Verás*, 1837, and *La Escuela del Matrimonio*, 1852, are classics.

Breton Language and Literature, the Breton language belongs to one of the Celtic dialects, forming a group of the Indo-European family; it is classed with Welsh and Cornish. The Breton dialect is not a *patois*, since its idiom is exceedingly exact and precise, and the mechanism of its grammar is subject to strict laws based upon the phonetic methods of the Indo-European languages; in Sanskrit alone is this exemplified in a higher degree. Among the many dialects into which the original Breton has, like all oral languages, become subdivided, four stand out, those, viz., of Léon, Cornouailles, Tréguier, and Vannes. The Léonard is the one which remains nearest to the original, and the Celts of Brittany look upon it as their classical dialect. Breton is the language spoken by the Britons who fled to Armorica or Brittany in the 5th and 6th centuries. It is still spoken by the 'Bretons bretonnants'—the Bretons of Lower Brittany. Up to the 11th century there existed no monument of Breton literature. A few MSS. containing glosses, which have recently been collected in one vol. by J. Loth (*Vocabulaire Vieux-Breton*), were all this period produced. From the 11th century to modern times there are the *Charter of Quimperlé*, and many mystery plays, such as *Le Mystère de Sainte-Nonn* and *Le Grand Mystère de Jésus*. In the 19th century Legonidèc, Brizeux, Luzel, Proux, Le Braz, De la Villemarqué, and other pioneers brought about a literary renaissance. Dramas, lyrics, hagiologies, dictionaries, and vocabularies were produced in great number, and were received with enthusiasm. The Bretons were reminded again, as they had been reminded in the 17th century by Julien Maunoir, that they were a nation. One of the most representative works of the modern movement is *Deleu Dir* ('The Harp of Steel'), by Fanch Jaffrennou. But the Breton genius is best expressed in the oral literature of the anct. bards and story-tellers. Gweznon, Taliez, Mezzin, or Merlin, and Sulio can still be recognised in the popular traditions which are saturated with the marvellous, the supernatural, the ideal, with stories of adventure and of the sea.

Bretschneider, Heinrich Gottfried von (1739-1810), a Ger. satirist, born at Gera. He attended the Moravian Institute at Elbersdorf and the Gymnasium at Gera. In 1778 he obtained the office of librarian at the University of Ofen, and in 1782 a gov. appointment. His manners and mode of living were very eccentric. His best satires are *Almanach der Heiligen Auf.* 1788, and *Wallers Leben und Sitten*, 1793.

Bretschneider, Karl Gottlieb (1776-1848), a Ger. theologian, born at Gersdorf in Saxony. He studied theology at Leipzig, and the penetration of his intellect attracted the attention of F. V. Reinhard, preacher to the court at Dresden, through whose influence he became pastor at Schneeberg in 1807. He was appointed general superintendent at Gotha in 1816. B. can hardly be termed a pure rationalist, but he showed decided rationalistic tendencies. His theological works are numerous.

Bretten, a German tn. on the R. Saalbach in the duchy of Baden, about 15 m. from Karlsruhe. Melancthon, the reformer, was born there on Feb. 16, 1497. The Elector Palatine Frederick II. originally had jurisdiction over the tn. Pop. *c.* 4000.

Bretts and Scots, Laws of the (Lat. *Leges inter Brettos et Scotos*), the name applied to the laws relating to the Celtic tribes of Scotland in the 13th century. The Scots were Celtic tribes in the Highland dists., and the Bretts were the remnant of the Britons occupying the dist. of Strathclyde, or Cumbria. The district of Cumbria was held by the heir to the Scots throne, who was known as the 'Prince of Cumbria.' The Bretts and Scots were conservative in their Celtic traditions and institutions. but in 1305 Edward I. of England ordained 'that the usages of the Scots and Bretts be abolished, and no more be used.' The fragments of the laws which remain are similar in many ways to the Brehon Laws of the Irish. The system was an elaborate 'valuation' scheme, fixing the prices or 'cow' at which every man and woman was valued, from the king to the villain or churl. The basis of valuation was a cow—the king was valued at 1000 cows and a churl at 16. Hence was arranged a system of compensation for various injuries and crimes.

Bretwalda was a title used in Anglo-Saxon times. The exact meaning and limitation is not known, but the term is to be found in a charter of Athelstone 934, in which he is styled 'Brytaen-

walda of all the island. According to Palgrave, the explanation is that of 'wielder of Britain.' Kemble considered it to mean 'a wide ruler.'

Breughel, Pieter, a Flemish painter and founder of the family of that name, which became famous for painters. He was the son of a peasant, and received instruction during his youth in painting, afterwards travelling fairly extensively in France and Italy. He became a member of the Academy of Antwerp about the year 1551. His work is distinguished by its humour, and he generally portrays a rustic subject. He died about the year 1570. His son Pieter is known as Hell B., because of the weirdness of the subjects which he usually chose to paint. Another son, Jan, known as Velvet B., is noted for his studies of still life and for his land- and seascapes. He travelled extensively in Italy, living for some time there. He painted parts of the landscapes of some of Rubens' pictures. He gained a considerable reputation as an artist and left a large number of pictures.

Breun, Jean E., Comte de l'Hôpital (1862-1912), portrait painter; gained medals both at the Academy Schools and at the Royal Academy, in 1884, for the best drawing of a figure from life. His chief portraits are 'Adelina Patti,' 'Countess of Londesborough,' 'General Sir Redvers Buller,' 'Dr. W. G. Grace,' etc.

Breunnerite, a mineral consisting of magnesium carbonate, $MgCO_3$, together with oxide of iron. It is a variety of magnesite, and is rarely found in the crystalline form.

Breve is a note in music. It has now the greatest time value, being equal to two semibreves. It is written thus |=| or ||⊃||, and is most common in church music.

Breve, an old Scotch law term, denoting a writ issued by Chancery ordering a judge to try by jury questions relating to: 1. Inquest (to ascertain heirs); 2. Tutory (appointment of guardians); 3. Idiotry (appointment of guardians for the insane); 4. Terce (recovery of a widow's dower); 5. Division among heirs—portioners.

Brevent, a mt. of the Pennine Alps, Savoy, rising above the valley of Chamonix. Its summit (alt. 8283 ft.) commands a fine prospect of Mont Blanc.

Breves, a Brazilian town situated in the state of Para, in the S. of the island of Marajo. Pop. 13,000.

Brevet, a word used to denote commission given to officers of the British army, of or above the rank of captain, to a higher rank without regard to the number of vacancies there may be in the higher order. A general B. formerly occurred at intervals of five years, but it gradually became confined to occasions of public thanksgiving, *e.g.*, coronations and satisfactory conclusions of military service. The system was found to be vicious, because the rate of promotion was not adjusted according to demand. In 1854 general Bs. were abolished, and a system of individual Bs. was organised for distinguished military service. Bs. are not given in the navy. In the United States the system applies to first lieutenants and officers above that rank, but the commission does not entitle the holder to a higher rate of pay.

Breviarium Alaricanum, a collection of Roman law, compiled by the command of Alaric II., King of the Visigoths, in the year A.D. 506. In it are contained sixteen books of the Theodosian Code, the novels of Theodosius II., Valentinian III., Marcian, Majorianus, and Severus; the *Institutes* of Gaius, five books of the *Sententiæ Receptæ* by Julius Paulus; thirteen titles of Gregorian Code, two titles of Hermogenian Code, and a part of the first book of the *Responsa Papiniani*. By many people it is thought that Anianus was the composer of this code, and hence it is often called the 'Breviary of Anianus,' but by the Visigoths it was known as 'Lex Romana.' It was only in the 16th century that it received the name of Breviarium, to distinguish it from a later edition that was introduced in the 9th century for the benefit of the Romans in Northern Italy. This B. A. is the only collection of Roman law containing the first five books of the Theodosian Code and the five books of the *Sententiæ Receptæ*, which has been preserved, and at one time was the only work known, until the discovery of some MS. in a library in Verona.

Breviary (Lat. *breviarium*) is the book which contains the offices for the canonical hours in the Roman Catholic Church. Though 'breviary' means 'a summary,' it was probably used because it was 'a compilation' of the various books (Psalms, prayers, etc.) needed in any one service. There are eight canonical hours. First comes the Matins, which really belong to midnight, but are said in Italy about 7.30 a.m. On Sundays this service is divided into three 'Watches of the Night.' 'Lauds,' or 'Morning Praises,' should be said at sunrise. The other services, or 'Little Day Hours,' are Prime (6 a.m.), Terce (9 a.m.), Sext (noon), and None (3 p.m.), named after the hour in the day at which they occur, 6 o'clock being the first hour. All these consist of a hymn, portions of the Psalms and prayer. The seventh service, Vespers, is proper to sunset, whilst 'Completorium,'

9 p.m., during a great many saints' days adds much to the monotony of the 'Little Hours,' as it means that whilst fifty psalms are continually recurring, the rest are rarely sung at all. Only in monasteries or other religious associations can men fulfil all the offices of the B. at the appointed hour. It is usual, therefore, in all cathedrals to mass the services together, and to celebrate Matins and Lauds at 8 a.m., the Little Hours at 10 a.m., and Evensong and Compline at 4 p.m. In 1536, a Spaniard, Francis, Cardinal of Quiñones, made sweeping reforms in the B., by which he ensured that all the Psalms were read each week, and the major portion of the Bible each year. Although Rome refused to accept his innovations, it is of exceptional interest to Englishmen, as the prefaces of the Eng. Prayer-book are largely modelled on those of the cardinal, and the daily services of the Eng. Church are little more than condensations of the offices he enjoined. In 1568, however, with the sanction of the Council of Trent, Pope Pius V. imposed the Roman B. on all Latin churches whose breviaries were not 200 years old. Formerly each bishop was allowed to choose the B. for his own diocese. Except for the Mozarabic B. in use at Toledo, and the Ambrosian that is followed in Milan, the Rom. has effectually suppressed all others. The reformed Fr. B. is now confined to Lyons, as the result of a determined Ultramontane movement during the pontificate of Pius IX. Its disappearance is to be regretted. It did away with the invocation to saints, as historical research had demonstrated the legendary character of their lives, and for the first time the antiphons and were faithfully copied from tural text. The B. is divided parts, of which the weakc third, entitled *Propium Sc* It contains abstracts of the lives of saints, and forms an incomplete summary of church history. A Catholic is not obliged to believe these biographies. The earliest printed Bs. have a high bibliographical interest.

Brewer, John Sherren (1810-79), English historian, born at Norwich. He was the son of a Baptist schoolmaster. In 1833 he graduated with honours in classics at Queen's College, Oxford. He was appointed to the chair of English in King's College, London, in 1841. He did much valuable research work. He pub. and ed. the *Monumenta Franciscana*, 1858; Bacon's *Opus Tertium* and *Opus Minus*, 1859; and a portion of the works of Giraldus Cambrensis, 1861. Through the influence of Disraeli, he secured the crown living of Toppesfield, Essex, where he had leisure to continue his scholarly commentary on the records of the reign of Henry VIII.

Brewing, the name given to the preparation of an alcoholic beverage from a farinaceous grain by means of fermentation. Rice, maize, and millet seed are used in various parts of the world for this purpose, but the term is usually understood to denote the 'rom 'reat dis- life as a popular national beverage on the banks of the Nile 3000 years before the Christian era. The mention of beer also occurs in the works of Pliny, the Rom. historian of the first century A.D., but in British literature references to mead and cider are found long before any description of drinks brewed from barley. Little information is available about B. in England prior to the Reformation, but an authentic reference to a London association of trade brewers is found in the chronicles of the early part of the 15th century. Private B. was extensively practised by the wealthier classes, and descriptions of the making of the brew in contemporary records show that this must have been one of the most complicated arts the Elizabethan housewife had to master. Until comparatively recent years the butler in a wealthy English family was often an expert brewer, but the practice of private B. is now almost extinct, and like many manufactures once carried on in the home, B. is now only carried on in large establishments by the use of elaborate plant under expert 's short summary es involved in B. 'e *describing* the 'd in greater de- ' the barley is first converted by a process of germination into malt (*see* MALT), which is then steeped in hot water, whereby, by means of a chemical reaction to be described later, the starch contained in the malt is converted into sugar and dextrin. (2) The liquid, now called the 'wort,' is drawn off and boiled with hops (*see* HOPS), which *impart a bitter flavour together with* preservative properties. (3) The wort is transferred to large vessels and yeast is added, which causes the process of fermentation to set in, in which the sugar contained in the liquid is converted into alcohol. (4) Finally, the liquor is drained from suspended matter and stored for periods varying

with the variety of beer. In no industry is the condition and chemical composition of the raw materials of greater importance than in the manufacture of beer, and a description of the three substances—barley, water, and hops—which form the basis of the manufacture, will now be given.

Barley.—Grains of barley are mainly composed of starch, water, cellulose, and certain albuminoids. Starch, which forms the largest constituent of the grain, is the foundation substance of the B. process since it is the source of sugar, alcohol, and dextrin. The varieties of barley (*see* BARLEY) which are found to yield the brewer the best results are the two-rowed and six-rowed varieties, and of these the Chevalier two-rowed variety (so named from its accidental discovery by the Rev. John Chevalier) is the most popular. The valuation of barley is chiefly carried out by an observation of its physical properties, although the use of germinating machines to discover whether the grain will yield good results on the malting floor gives more reliable results. The grains should be full, large, and of even size, neither immature nor over-ripe, and should be dry and sweet smelling. The appearance of a section cut across the grain gives an idea as to whether there is a good yield of starch or not. The character of the endosperm can be scientifically examined with the aid of a germinating machine. This is simply a vessel containing water with a perforated plate, in the holes of which the corns to be examined are placed and covered over with sand. After a few days the state of growth produced by germination is observed, and thus a measure of the germinating power of the grain is obtained.

Water.—The characteristic qualities of beers brewed in particular districts are to be attributed very largely to the inorganic compounds present in solution in the water supply of the district. Thus the well-known Burton ales owe their characteristic qualities largely to the comparatively [illegible] of calcium sulphate [illegible] n the water of [illegible] it is necessary for the water used in B. pale ales to contain a large proportion of calcium sulphate, for the production of black beers it is essential to use water containing a minimum of dissolved salts or containing for the most part only such salts as calcium and magnesium acid carbonates which will be precipitated on boiling. The modern brewer, however, is to a certain extent independent of the qualities of his water supply since he can by artificial treatment add to or diminish the amount of dissolved substances present. Careful analyses of the different kinds of beers and ales have been made, and the percentage composition of the water supply tabulated in each case. Thus a 'Burton' ale can now be manufactured with a comparatively soft water supply by the addition of calcium sulphate to the water. Conversely a hard water can be used for the B. of black ales after the calcium and magnesium sulphates have been precipitated by boiling with sodium carbonate.

Hops.—Hops used by brewers are the fruit of the female plant (*Humulus lupulus*), consisting of bright yellowish coloured cones. The colour of the flowers and the aromatic smell of the hops are qualities which help in the task of valuation. Good hops should feel clammy when handled, although the presence of mould arising from dampness is extremely undesirable. The compounds present in the hops which play a part in the B. process are chiefly tannin, essential oils, resins, and diastase. The essential oils contribute the aromatic flavour while the resins are responsible for the preservative properties and partly for the bitter principle. The bitter taste supplied by the use of hops overcomes the somewhat sickly taste of the malt, and their use helps to avoid the souring of beer by preventing the further fermentation of alcohol into acetic acid. They also help to precipitate nitrogenous matter and hence to clarify the wort in the boiling process.

Manufacture of malt from barley.—The initial treatment of the barley is termed screening, and consists in freeing it from dust and extraneous matter by sifting and cleaning the grain. The prepared grain is then ready for the malting process, whereby it undergoes important changes in constitution, chief of which is the secretion of an enzyme called diastase. The enzymes are a class of substances about the chemical constitution of which little is known, but which possess the property of being able to decompose certain organic compounds such as starch and sugar into simpler substances. There are two methods followed in the malting of barley, the 'floor' method and the 'pneumatic drum' method. In the floor method the barley is first steeped in water for a period of two or three days. It is to be noted that although the water in which the grain is steeped is changed every twenty-four hours, its composition has an effect on the ultimate product of the brew, and so the nature of the water supply for the steeping operation has to be

taken into consideration, as well as that used in the boiling and mashing processes. During steeping, the grain absorbs the necessary moisture for germination, swells considerably in size, and becomes full and soft. The operation is carried on in cisterns having draining racks at the bottom to facilitate [illegible] After [illegible] in heaps, situated [illegible] building in a dry position, concealed from the sun's rays, and having thick walls so that the temperature can be maintained constant. It is essential that the germinating process should be kept well under control, and should proceed fairly uniformly throughout the material. Heat commences to be evolved as the grain in the middle of a heap germinates, and consequently the heaps are constantly raked over, so that no part of the grain germinates quicker than another. The temperature and ventilation of the house are also carefully controlled, the former being kept at about 60° F., and water is occasionally sprayed over the grain. The process of 'pneumatic' malting, which is of modern invention, is similar in principle to that just described, the improvement, however, consisting in the fact that, instead of being spread on a floor and raked by hand, the grain is placed in revolving cylinders of such construction that their ventilation and temperature can be controlled. Under the influence of warmth and moisture germination commences within the corn. Carbon dioxide (carbonic acid gas) is given out by the young seed, the albumen inside the grain being consumed and the embryo at the base of the starchy matter commences to grow. The rudiments of the stem, or acrospire, begin to grow after about a day on the malting floor. The process of malting is complete when the acrospire has attained the opposite end from which it sprung. As the acrospire would in the natural course of things shoot forth with the formation of a leaf after this, steps are taken to stop further growth, the internal changes which the malster desires, viz. conversion of part of the starch into sugar and mucilage, having now taken place. The arresting of further growth is performed in the drying kiln, where the malt is spread on a floor above an oven. Moisture is first driven off by the application of a moderate heat, and then the temperature is raised to the neighbourhood of 170° F., in order that the 'withering' process may be effected.

Mashing.—The malt is now ready to be used in the B. process proper. The system of B. described is that chiefly in use in the United Kingdom. As the different processes of B. consist in the successive treatment of the extract obtained from the raw materials, it will be seen that it is advantageous to make the brewery a fairly high building, so that the liquid can be drawn off after treatment in one vessel and allowed to run into a receptacle on a lower story, where the next operation can be carried out. At the top of the building are placed hoppers containing grist, together with a cistern containing water heated to about 170° F. 'Grist' is the name given by brewers to the crushed malt, and is prepared by passing the dried malt between steel rollers. The mash-tuns are placed below the hoppers, but on its way to the mash-tun the grist has to pass through the m[illegible] is a cylindrica[illegible] which passes a[illegible] ing blades fixed[illegible] axis. Warm w[illegible] same time as t[illegible] of the machine mash-tun a mixture which has something of the consistency of porridge. The mash-tun is a large iron vessel containing a false bottom, and with a shaft passing through its centre to which are fixed a system of stirrers. Into the bottom of the mash-tun a certain amount of hot water is run. It is in the mash-tun that the enzyme diastase, secreted during the malting process, acts upon the starch of the malt. In the presence of the tepid water the diastase converts the starch into malt sugar or maltose and dextrin, and as excess of the enzyme is present, it is capable of transforming a further quantity of starch, which may be added in the form of unmalted barley, or as is done on the Continent, in the form of potato starch or rice flour. Another important chemical reaction also goes on in the mash-tun resulting in the production of soluble albuminoids, which are necessary later on in order that the yeast may ferment the wort properly. The amount of water added and the temperature and consistency of the mash is varied according to the kind of liquor to be brewed and the previous preparation of the malt. Danger of the formation of acetic acid oc[illegible] [illegible] empera-ture is [illegible] F. After the liqu[illegible] covered up and left for two or three hours, when the action is complete, practically all the starch having been degraded. The products of the reaction are separated by means of filtration through the false bottom of the tun, but after this operation has been

performed a further supply of the liquor, which is now called 'wort,' is extracted from the remaining solid matter by 'sparging.' Sprinklers supplying hot water are made to revolve inside the mash-tun, whereby the remaining wort is extracted.

Boiling process.—The wort is then run into large boiling coppers, which are situated on the next lower stage of the brewery, and hops are now added. The function of the hops in preserving and bittering the beer has already been referred to, but in the boiling copper they perform another function in that the tannin matter they contain precipitates excess of albuminoid matter which would otherwise cause trouble later on. The boiling is continued for about two hours, and the liquid is then passed into a draining vessel, where it is freed from remnants of the hops and suspended matter. It is then cooled by means of refrigerators. Rapid cooling is resorted to in order to prevent the formation of acetic acid. It is then run into the fermenting vessel.

Fermentation.—The initial temperature of fermentation is of the utmost importance, and for different kinds of beer it varies somewhat, the average temperature being about 58° F. The temperature of the fermenting vessel is maintained at the required value by means of an attemperator, a pipe passing through the vessel through which hot or cold water may be circulated as required. The initial temperature of the wort in the fermenting vessel is called the 'pitching' temperature. If the pitching temperature is too high the fermentation will go beyond control, while if it is too low the taste of the beer will be spoilt. Yeast is now added, and the fermentation (*see* FERMENTATION) commences. The yeast cells feed on the sugar present in the wort and rapidly increase in number, large quantities of carbon dioxide being evolved. The quality and freshness of the yeast employed is a matter of great importance. The process of fermentation was once thought to be effected by dead matter, but Pasteur showed that it is carried on by the living yeast cell which feeds on the nitrogeneous matter of the wort and breaks up the fermentable sugar present into alcohol and carbon dioxide. The carbon dioxide evolved in contact with glutinous matter forms a frothy 'head' in the fermenting vessel sometimes two feet in height. Rapid propagation of the yeast cells occurs, and hence a large crop of yeast results, which rises to the surface. The great danger which has to be guarded against is the production of acetic and lactic acids, which are produced if the yeast has contracted acidity or putrefaction, and which spoil the taste of the beer. The best yeast is obtained from that formed in the B. of porter. The amount of yeast to be added depends upon the condition of the wort and upon the state of the malt originally used, a malt dried at a high temperature or a 'patent' malt requiring more yeast to be added in the fermenting vat than other varieties. In some breweries the whole of the yeast is added at one time, while in others amounts are added at varying periods. As the fermentation proceeds an increasing volume of carbon dioxide is given off, which eventually bursts through the glutinous surface, and after this has taken place the yeast formed at the top of the liquid becomes more compact. The yeast is then skimmed off in order that the beer may not be contaminated with any putrifying matter. During the process of fermentation, which lasts usually for three or four days, the temperature may rise as much as 20° F., but by means of the attemperator this can be kept within safe limits. It is necessary to prevent the acetous fermentation which would follow the alcoholic fermentation from now taking place, and this is achieved by the process of cleansing.

Cleansing.—'Cleansing' is effected by running the beer into a large vessel in the cleansing house. From this vessel it is run into casks which in a large brewery may number many hundreds. The bung-holes of the casks are left open, and the yeast, which is still being formed within the beer works out of the holes gradually, and is collected by means of pipes in a trough. An alternative method of cleansing, much used with pale ales, is to add a quantity of hops to the fermented liquor, which carry down any remaining yeast with them on settling. If the beer still remains muddy in appearance after the cleansing process is completed, recourse is made to the use of 'finings.' 'Finings' are usually made by dissolving a substance called isinglass in sour beer so as to form a mucilage, and a little of this added to the liquor has the effect of precipitating any suspended matter. The liquor is now ready for storing, which should be done in casks in a cellar where the temperature can be kept low. Mild ales can be sent out to the consumer direct, but pale and bitter ales require at least six weeks storage.

Chemistry of brewing.—The chief chemical reactions in the B. process are brought about by means of en-

zymes, a class of compounds to which reference has already been made. The enzymes are albuminoid substances, little at present being known about their constitution. They are characterised by the pro
being able to decompose ce
bohydrates into substances
constitution, the decomposi
brought about by the addition of a molecule of water, and thus being one of hydrolysis. About the mechanism of this remarkable process little, however, is as yet known. The secretion *of the enzyme diastase during the* malting of the grain has already been referred to. Diastase attacks the starch in the malt, and converts it partly into dextrin and partly into a sugar called maltose. The chemical equation

$$3C_6H_{10}O_5 + H_2O = 2C_6H_{10}O_5 + C_6H_{12}O_6$$
(starch) (water) (dextrin) (sugar)

summarises the facts just stated, although it is probably not a correct statement of the mechanism of the reaction. The boiling of the wort after it has been extracted in the *mash-tun prevents this diastatic fer*mentation from proceeding further. During the process of fermentation the sugar thus produced is converted *into alcohol. The function of the* yeast in the process of fermentation was the subject of an historic controversy between Liebig and Pasteur. Liebig promulgated the theory that
ke yeast
of the
nolecules
occurs, and under the influence of this disturbance the neighbouring sugar molecules are disrupted. Pasteur showed, however, that yeast is composed of living cells which required oxygen for their existence, and for the carrying on of the fermenting process. A distinction was for long made between the action of enzymes like diastase, which is an amorphous substance, and apparently lifeless, and that of living organised ferments like yeast. The researches of Buchner, however, have shown that the views of both Liebig and Pasteur were true to a certain extent. Buchner extracted what he called 'expressed yeast juice' from dead yeast cells, and found that it contained a substance which could set up fermentation by itself, and which he called zymase. It is evident that this substance is an enzyme formed by the living yeast cell, and that it decomposes the sugar when it comes into contact with it in the fermenting vessel. The distinction between lifeless enzymes and living organised ferments has therefore to a large extent been proved to be meaningless.

Analytical tests used in brewing.— It is of importance in the case of malt to know the amount of malt extract it will yield and also its diastatic activity. The first quantity is esti-
eighed quan-
h water and
f the filtrate
to a definite
volume. From this value of the density it is possible to calculate the amount of malt extract in the sample, since standard researches have been made to determine the alteration in *density effected by dissolving 1 gram* of malt extract in 100 c. cms. of water. Upon the diastatic capacity of the malt depends its power of converting starch into sugar, and hence its determination is a matter of some importance. The method used is to estimate the time taken for the process of saccharification to be completed. It is well known that when a drop of iodine is added to starch solution a distinctive blue colour is produced, which serves as a test either for free iodine or for starch. A sample of the wort is prepared and a drop of *iodine solution added to a small* quantity of it. The operation is periodically repeated, and when no coloration results it is known that *all the starch in solution has* been degraded, and the time which has elapsed is a measure of the diastatic capacity of the malt. The analysis of the wort is made in order to determine the amount of fermentable sugar present. This is carried out by means of Fehling's test and polarimeter readings. Fehling's solution is a solution of copper sulphate and Rochelle salt, and when added to a solution of a sugar (other than cane sugar) a bright red precipitate of copper oxide is obtained, and thus a
titration the
is obtained.
use of the
Both maltose and dextrin give solutions which *are said to be optically active, i.e.* when a ray of polarised light is passed through them the plane of polarisation is rotated through a certain angle. *This remarkable property is always* found in the case of substances like the carbohydrates in question, which possess a carbon atom within the molecule that is linked to four other different atoms. By means of the polarimeter the amount of rotation suffered by the plane of polarisation of a ray of polarised light passing through a known length of solution can be determined. Now the amount of sugar present has been first estimated by Fehling's solution, and hence by consulting tables the angle of rotation due to this constituent can

be obtained. Subtracting this from the total rotatory power observed, the rotatory power of the other constituent—the dextrin—is known, and from this value, with the aid of tables, the amount of dextrin present can be calculated. The percentage of dextrin and maltose present in the wort is thus known. The ratio of dextrin to maltose in the wort is a matter of great importance, since it influences the subsequent fermentation, the presence of too little dextrin producing a 'thin,' weak beer.

Varieties of beer.—The two main varieties of beer consumed in the United Kingdom are ales and porter. *Ales* are of two kinds, mild and bitter, and their difference in taste is due to the fact that a larger amount of hops has been used in the case of the bitter ale than in the case of the mild. They are manufactured from pale malt which has not been heated to a high temperature in the malting kiln. The process of slow fermentation which goes on in the casks while the ale is being stored and the consequent formation of carbon dioxide is the source of the refreshing and 'sparkling' qualities which characterise this beverage. In order that this slow fermentation may take place, the presence of a certain amount of fermentable sugar in the casks when they are stored is necessary. It is to ensure this that the temperature of fermentation in the brewing of ales is kept low, 70° F. being the maximum temperature. Great care is also taken over the skimming process, in order to prevent acetous fermentation. *Porter* is prepared from dark and patent malts, to which it owes its colour. As has already been pointed out, it is necessary that the water supply in this case should be comparatively soft, that in the neighbourhood of London and Dublin having been found most suitable for the purpose. *Lager beer* is a well-known German beer, and is now brewed in England. Its preparation differs from that of ale and porter chiefly in the pitching temperature, the slowness of the fermenting process, the use of 'bottom' yeast, and the method of storing at a very low temperature. The slow method of fermentation enables the yeast plant to consume the proteid matter present, and consequently there is less chance of souring occurring through putrefaction. In the bottom fermentation process, bottom yeast is employed, a variety so called on account of the fact that it remains at the bottom of the tun instead of rising to the top like the better-known variety. The two varieties are similar in appearance, but the bottom yeast is composed of smaller cells. The fermenting tuns are smaller than those used in the English system, and are placed underground, the temperature being kept low by means of refrigerators, which results in the solution of a maximum amount of carbon dioxide. The action lasts about twelve days as compared with three days in the English process. The resulting beverage contains much more carbon dioxide in solution than ordinary pale ale, while it contains less alcohol.

Beer duty.—The duty on beer per barrel of thirty-six gallons is 7*s.* 9*d.*, the beer being of sp. gr. 1·055.

Consumption of beer in the United Kingdom.—The production and consumption of beer in the United Kingdom have shown a gradual decline during the last ten years. The raising of the taxes on alcoholic liquors by the Budget of 1909 caused a considerable fall in the returns for that year. In 1899, 37,404,000 barrels of beer were made, and 58,744,000 bushels of malt and corn were used, while the corresponding figures for 1910 were 33,471,000 barrels of beer and 50,069,000 bushels of malt and corn.

See Scammell, *Breweries and Malting;* Baker, *Brewing Industry;* W. J. Sykes, *Principles of Brewing;* Wright, *Brewing with Raw Grain, Handy Book for Brewers.*

Brewood, a tn. situated in the W. of the co. of Staffordshire. It is 8½ m. from Stafford. Pop. 2948.

Brewster, Sir David (1781-1868), a Scottish natural philosopher, was born at Jedburgh. His father was rector of the grammar school in that tn. He was sent to Edinburgh University at the age of twelve to study for the Church of Scotland, but his bent was towards natural science. He finished his course in divinity, but never entered into active ministry in the church. The study of the diffraction of light became the ruling passion of his life, and he contributed a series of papers on the results of his investigations to the scientific journal known as *Philosophical Transactions.* In 1802 he became editor of the *Edinburgh Magazine,* and in 1808 of the *Edinburgh Encyclopædia,* in which he wrote several important scientific articles. In 1816 he invented the optic toy known as the kaleidoscope. Wheatstone's stereoscope he greatly improved by substituting lenses for the mirrors which the inventor had used to combine the pictures. But his name will be eternally associated with the dioptric apparatus, *i.e.* a method of lighting adopted in lighthouses in which the illumination is generated by a central lamp, the rays

from which are transmuted by an arrangement of lenses surrounding it. The invention of the apparatus has been accredited by some to Fresnels, but B.'s claim is probably stronger. The introduction of the apparatus into British lighthouses was due to the energy and zeal of the scientist. In 1774 B. continued his literary work by becoming, with Robert Jameson, joint-editor of the *Edinburgh Philosophical Journal*, which succeeded the *Edinburgh Magazine*. B. split partnership with Jameson in 1824, and started a new journal entitled the *Edinburgh Journal of Science*. He contributed many valuable scientific articles to the seventh and eighth eds. of the *Ency. Brit.* He wrote some entertaining *Letters on Natural Magic* which he addressed to Sir Walter Scott, an entertaining little vol. called *More Worlds than One*, and a book entitled *Martyrs of Science*. But his literary fame will rest chiefly on his *Memoirs of the Life, Writings, and Discoveries of Sir Isaac Newton*—to [illegible]ch he devoted [illegible]upulous pre- [illegible] of his in an *Review*, the British Association for the Advancement of Science owes its origin. B., Babbage, and Herschel, were the active shapers of its constitution. In 1832 B. was knighted, and in 1838 he was appointed prin. of the colleges of St. Salvador and St. Leonard, St. Andrews. He had many European honours, and was one of the eight foreign associates of the Fr. Institute. In 1859 he was made prin. of Edinburgh University, where he remained till shortly before his death, which took place at Allerly, Melrose. In the old quadrangle of Edinburgh University is an imposing statue of this eminent scientist.

Brexia is a genus of Saxifragaceæ which contains a solitary species. This is an elegant tree with a fine foliage and green flowers in axillary umbels which are surrounded by bracts on the outside. The leaves are covered with a resinous matter which causes rain to run off them immediately. B. is a native of Madagascar.

Breyell, a tn. of Rhenish Prussia, in the circle of Kempen. Pop. 6000.

Brezowa, a tn. of Hungary in the co. of Neutra, 10 m. N.W. of Leopoldstadt. Pop. 6430.

Brialmont, Henry Alexis (1821-1903), a Belgian general and author, was the son of General Laurent B. In 1843 he passed from the military school at Brussels into the army as sub-lieutenant of engineers. His advance was rapid. From 1843 to 1874 he rose to the rank of major-general, having been successively lieutenant, private secretary to General Baron Chazal, War Minister (1847-50), major, lieutenant-colonel (1864), and in 1868 colonel. As major-general he became director of fortifications in the Antwerp dist., and within the year inspector-general of fortifications and of the corps of engineers (1875). It was probably the unpopularity of his elaborate schemes for reformed fortifications at home that induced him to accept an offer from the Roumanian gov. to take over the direction of the works necessary for the country's defence. He actively identified himself with the scheme which raised Bucharest to a first-class fortress, and it was probably at the instance of Austria, a country which feared the growing strategic importance of Bucharest, that the home gov. was persuaded to do without his services in future. In 1884, however, he was reinstated in his former command of the Antwerp dist. As engineer of the entrenched camp of Antwerp (begun in 1859), he followed the ideals of the polygonal school. Later, however, he trusted to his own judgment. Thus in his construction of the fortifications at Namur and Liège he suppressed every artillery position exposed to fire from above, and increased the number of intermediate batteries. Among his many important publications may be mentioned his last, entitled *Progrès de la défense des Etats et de la fortification permanente depuis Vauban*, 1893.

Brian, surnamed **Boroimbe** (Boru) (*d.* 1014), belonged to a tribe of N. Munster. When his brother, the king of Munster, died in 976, he ascended the throne and began his career of conquest. On subduing Leinster, he next overcame the Danes estab. near Dublin, and after killing Malachy, the king of Ireland, was himself recognised as 'ardri,' or ruler of his country. He was fighting the Danes at his death.

Brianchon, Charles Julien (1785-1864), a French mathematician, born at Sèvres. After having studied at the Ecole Polytechnique he was made, in 1808, lieutenant of artillery. He next became assistant director general of the manuf. of arms in France, and later professor of applied science at the Ecole d'Artillerie. Among his works are: *Mémoire sur la poudre à tirer*, 1823; *Essai chimique sur les réactions foudroyantes*, 1825.

Briançon, a Fr. tn. in the dept. of Hautes-Alpes. It is one of the highest towns in Europe, situated 4300 ft. above the level of the sea. It is about 160 m. by rail from Marseilles. It is extremely well defended by its high position, and also very strongly fortified. The manufs. are scent, leather, silk, and turpentine. B. is

probably on the site of the old Rom. stronghold Brigantium. Pop. 7455.

Briand, Aristide (*b.* 1862), Fr. statesman, sprang from a bourgeois family. He early identified himself with the most advanced thinkers of the day, and after contributing to the anarchist paper, *Le Peuple*, became joint founder with Jean Jaurès of *L'Humanité*. At the Labour Congress in Nantes, 1894, he passed a resolution in favour of labour union. In 1902 he entered parliament as a leader of the Socialists. He was very largely responsible for the law of separation of church and state, and took care to see it [illegible] His acceptance, i: [illegible] folio of public Sarrien ministry resulted in his exclusion from the Socialist party. Contrary to Jaurès, he held that, where possible, Socialists should support Radicals in measures of reform.

Briansk, a Russian tn. situated on the r. b. of the Desna, and in the gov. of Orel. It trades with Riga and St. Petersburg in grain, hemp and hemp oil, honey, etc.; with Odessa in linen, iron goods, tar, lime, bark, cordage, and cables. There are fine forests of oak near by, which supply the imperial building yards situated in the town. Pop. 25,890.

Brianza, a hilly region of Italy, to the N. of Milan and to the S. of Lake Como. It is much frequented because of its charming mt. scenery, its fruitful valleys, and its delightful climate. It is densely populated, and is a favourite resort for the Milanese.

Briare, a Fr. tn. situated on the Loire, in the dept. of Loiret. It stands at the head of the Canal de Briare. It manufs. buttons and a fine pottery; it also trades in coal, wood, and wine.

Briareus, also named Ægæon, a giant of Greek mythology. He was one of three sons of Uranus (Heaven) and Gæa (Earth), and possessed a hundred hands. He assisted Zeus in the battle of the gods against the Titans.

Briar-root is a hard wood obtained from the root-stock of *Erica arborea*, the common heath-plant of S. France, which is largely used in the manuf. of pipes. *Bruyère* is the Fr. for heath, and the word has no connection with our briar.

Bribery, in Eng. law, has a fourfold signification: (1) The offence of a judge, magistrate, or any person concerned in the administration of justice receiving a reward from parties interested for the purpose of procuring a partial and favourable decision. Since the Revolution in 1688 judicial B. has been unknown in England, and since that date no case is reported in which this offence has been imputed to a judge in courts of superior or inferior jurisdiction. 'Embracery' is the offence of attempting to influence a jury corruptly to give their verdict in favour of one side by the promise of money or entertainment or by entreaties. The offence is a misdemeanour punishable by fine and imprisonment. A juror may be guilty of this offence if he corruptly influence his fellow-jurors. (2) The receipt or payment of money to a public ministerial officer as an inducement to him to act contrary to his duty. B. in a public ministerial officer is a common law misdemeanour in the person who takes and also in him who offers the bribe. B. with reference to particular classes of public officers has become punishable by several acts of parliament. B. of customs officials, officials of the Inland Revenue, and, under the Merchant Shipping Act, of officials of the Board of Trade is punished with heavy penalties. B. of officials invested with powers of local gov. or administering the rates is punishable with imprisonment up to two years, with or without hard labour, together with a heavy fine and incapacity to hold any public office either for a number of years or for life. (3) The giving or receiving of money to procure votes at parliamentary elections, or elections to public offices of trust. The Corrupt Practices Act, 1854, deals with the offence of corruptly influencing a voter to give his vote in any particular way. The Representation of the People Act, 1867, enacts that a corrupt payment of rates to enable a person to be registered as a voter so as to influence his vote at any future election is B. All kinds of conduct have been held to be B. The conduct need not be dishonest provided there be an intention to influence the mind of the voter. Charitable gifts or an increased scale at Christmas may be B. when a certain vote or votes is or are aimed at. A promise of a bribe is B., and so is accepting a bribe even though one does not vote. Where the gift of money or entertainment takes place after an election, the giver is not guilty of B. unless something has happened before the election to raise the hopes of the voter. A mere offer of sale of a vote is not B. (4) Miscellaneous: corrupt presentation to a benefice is B., and buying and selling of public offices is also B. at common law. B. may, under a recent act, be constituted by the taking of a secret commission. The gist of this offence is the making of a profit by an agent in the course of his employment without the knowledge of his principal.

Brice, St., was born at Tours, in

France, probably in the early part of the 15th century. He became a Fr. prelate, and upon the demise of St. Martin was chosen bishop of Tours. He died at his bp., and later on, Nov. 13 *was kept in memory of him. Upon* that day in 1002 a horrible massacre of the Danes was committed by King Ethelred's command.

Brick, a mass of clay, usually mixed *with sand, fine coal ashes, small coal* sifted, or other ingredients, tempered with water, shaped in a mould, and subsequently dried in the sun, and, in most cases, burned or baked in a kiln *or a heap or stack called a clamp.* The ancients used Bs. both baked and simply dried in the sun. Those found in the ruins of Babylon are among the oldest specimens existing. The Egyp*tians used sun-dried Bs., and the pro*cess of making them is represented in their paintings, some of which are peculiarly interesting from the light they throw upon the scripture narra*tive of the servitude of the Israelites.* The Romans, according to Pliny, began to use Bs. about the decline of the republic; but there are yet remains of a B. building called the *temple of the god Redicolus, which is* said to have been built on occasion of the retreat of Hannibal. It has been supposed that the Greeks did not use Bs. until after their subjugation to *Rome; but passages from Vitruvius* and other writers show that Bs. were in use before that period. The Greek names for Bs. were *didóron, penta*dóron, and *tetradoron*, terms formed *from doron*, a hand-breadth, and describing their size as equal to so many hand-breadths. They appear to have been used simply dried, as Vitruvius speaks of their requiring two years to dry, and of the laws of Attica requiring that five years be allowed for that purpose, and because further he warns against using them too new for fear of their shrinking. Roman Bs. were very thin in proportion to their length and breadth, and were well burnt. They resemble tiles more than modern Bs., and are formed of various dimensions, from 7¼ in. square and 1½ in. thick, or even smaller, to about 1 ft. 10 in. square and 2¾ in. thick. In Persia Bs. . . . baked. T. . . . clamp-bur. . . . are, like th. . . . straw cut . . . tenacity. . . . Bs., the te . . . removed f. . . . and turne. . . . posure to . . . use by the spring, when fine ashes are added to it in the proportion of one-fifth ashes to four-fifths clay, or 60 chaldrons to 240 cubic yds., which *will make 100,000 Bs.* When much sand is mixed with the clay, forming what is called a mild earth, a smaller proportion of ashes may be used. *This quantity requires also the addi*tion of about 15 chaldrons, or, if mild, of about 12 chaldrons of *breeze*, which is a kind of coarse coal ash, separated by sifting, to aid the burning. The clay and ashes being well mixed by *digging, watering, and raking back*wards and forwards with a pronged hoe, the mass is removed in barrows to the *pug-mill*, which consists of an upright barrel in which a series of *strong iron knives and teeth* are caused to revolve by the power of a horse walking in a circular path, so as to cut and masticate the clay very thoroughly as it passes from the top *of the barrel to an aperture provided* for its exit at the bottom. As the clay oozes out of the mill, it is removed with a *cuckold*, or concave shovel, and covered with sacks to prevent its dry*ing too fast. A person called the* feeder takes from the stock of clay thus prepared a piece about the size of a B., covers it with sand, and passes it to the moulder, who throws it with *some force into a wooden mould of the* size and shape of the B., which mould is previously sanded. Having filled the mould, the moulder cuts off any superfluous clay with a stick kept in *a bowl of water by his side, and then* removes the back and sides of the mould, after which the soft B. is carefully transferred from the bottom board of the mould to a pallet-board, and, when a sufficient number have been moulded, is conveyed with others to the *hacks*, which are long level lines raised about 4 in. from the surface of the field, and formed about 2 *ft.* 6 in. wide. The upper surfaces of the Bs. are previously sanded, and great care is taken to avoid twisting or otherwise injuring their shape in transferring them to the hacks, on which they are laid in two rows, with a little space between each to allow the free circulation of air. One double row being completed, another is put upon them, and this is *continued* until the Bs. are piled from seven to ten high. In putting them down the . . . man counts them, and makes a . . . ith a stick in every thousandth he hacks are covered with straw ght and showery weather, and ne brick-fields sheds are erected hem; but this plan is expensive, etards the drying. When par- dried, the Bs. are removed, l diagonally, with wider aper- and with the bottom Bs. brought to the top; and after this process, which is called *skintling*, they are removed to the *kiln* or *clamp*, which is a vast pile of Bs., laid to-

gether as closely as possible, on a slightly concave foundation of B. rubbish, the raised ends of which face the north and south. On this foundation the new Bs. are built up in lots or *necks*, of which the centre one, which is first erected, is vertical, while the others, owing to the concavity of the foundation, have a slight inclination towards it. Small spaces, filled with breeze, are left among the lowest courses of Bs., and flues or *live-holes*, about the width of a B., and from 6 to 9 ft. apart, are also formed to aid the lighting of the clamp, and filled with dry bavins or wood. When full, the clamp is surrounded by old Bs., or by the driest of those newly made, and a thick layer of breeze is spread on the top. The external Bs. are coated with a thin plastering of clay: and, if the weather prove wet, the kiln is protected by *loos*, or hurdles interwoven with rushes. The fire is lighted at the mouths of the flues or live-holes, which are closed when it burns well; and in favourable weather the Bs. will be completely burnt in about twenty-five or thirty days, in the course of which time the cindery matter dispersed through their substance becomes gradually ignited and consumed. Such Bs. as are found to be imperfectly burnt are put into the next clamp to be burned again. Those which are sufficiently burnt are separated, according to quality, into—hard sound *stocks*; *place*, or inferior soft red Bs.; and *burrs* or *clinkers*, which are black-looking masses of vitrified B., of very inferior value. Ordinary Bs. are moulded in this country 10 in. long, 5 in. wide, and 3 in. thick, and are reduced by drying and burning to about 9 in. long, 4½ in. wide, and a proportionate thickness. Kiln-burnt Bs. are, as their name implies, burnt in a kiln or oven instead of a clamp, and have no ashes mixed with the clay. Marl or malm stocks, which are either baked or burnt, take their name from the marl originally used in them, which has now given place to chalk. Dutch clinkers are a kind of small, hard, yellow Bs. Fire-bricks, also called Windsor Bs., are 1½ in. thick, and of a quality to resist the action of fire. Paving Bs., draining Bs., capping or coping Bs., cogging Bs., compass Bs., for wells and circular works, feather-edged or thin Bs. for the external parts of wooden buildings, and many other varieties of form, size, and quality, are also made. In some cases, a smooth or glazed surface is produced in the burning. Duties were formerly levied on Bs., but have long been repealed. There are two kinds of B. machine—one which works with clay in a semi-dry condition and thus saves time in drying, and the other which works with moist clay. In the latter the clay is fed into an upright pug-mill which mixes it to the desired consistency and forces it out at the bottom over carrying rollers, so that it passes between two pressing rollers which force it through a die giving it the required size. The block is then cut into Bs. by wires on a frame which is so arranged that the wires can cut rectangularly or at an angle. In the first machine the clay, already very solid, is forced by blades into shape on a revolving table which ejects them under a press. They are then ready for drying. *See* POTTERY. *See* Searle, *Modern Brickmaking*; E. Dobson, *Bricks and Tiles*.

Brickfielders is a term used in Australia to describe a hot wind which blows from the barren, sandy deserts of the interior. Like the strong 'southerly buster,' by which it is followed, it is occasioned by a cyclonic system over the Australian Bight. It is a healthy wind in that its extreme heat and dryness effectually destroys disease bacteria, but it parches vegetation and creates dreadful dust storms. Usually it blows several days together.

Bricklaying, *see* BRICKWORK.

Brick-making, *see* BRICK.

Brickwork, or the art of the bricklayer, consists in the judicious arrangement or fitting together of bricks to form a wall or other mass of building, so that they may mutually support each other, and that the strength of each individual brick, as well as that of the mortar or cement by which they are united, may be applied in the most effectual manner to aid the strength of the whole structure. This object, which is termed *bonding*, is accomplished by breaking or distributing the joints, so that two may never come immediately over each other, and by laying some of the bricks as *stretchers*, or stretching courses, with their length in the direction of that of the wall, and others, which are called *headers*, with their length running across, or in the direction of the breadth or thickness of the wall. The bonds in most common use are *English bond*, consisting of alternate layers or courses of headers and stretchers; *Flemish bond*, in which headers and stretchers are laid alternately in the same course, the headers of one course being laid across the middle of the stretchers of the course below it; *garden-wall bond*, consisting of three stretchers and one header in the same course; and *herring-bone bond*, which is sometimes used in the cone of very thick walls, and is produced by laying

the bricks at an angle of 45° with the direction of the wall, and reversing the inclination of each successive course. Whenever it is necessary, in order to prevent the *perpends*, or vertical joints, coming immediately over each other, a half, quarter, or three-quarter brick, or *bat*, is used to commence or finish a course. Walls, the thickness of which is 9 in. or equal to the length of one brick, are called single-brick; those half that thickness, half-brick; and others brick and a half, two bricks, two bricks and a half, etc. Arched and groined work requires peculiar care, and in many cases the cutting of the bricks to fit each to its particular bed; and in ordinary house building great neatness is called for in the formation of the flat arches over doorways and windows; but the details of these and other peculiar departments of the bricklayer's art cannot here be entered upon. Some further information on the subject is given under BUILDING. *Mortar*, the cement usually employed for B., is composed of either grey or white lime (the grey or stone lime being preferable), and river, sea, or road sand, mixed with water in the proportion of one part of grey lime to two and a half of sand, or one of white or chalk lime to two of sand. The dipping of the bricks in water as they are laid makes them adhere more firmly to the mortar. *Putty* is a very fine kind of mortar, made of lime and water only, used for delicate purposes, and such as the setting of rubbed or gauged arches, where the joints are visible. The foundations of a wall are always laid broader than the superstructure, and the broader courses are termed *foo*[illegible] themselves bein[illegible] den-walls are with piers or 4½ in., at intervals of 10 or 12 ft. When new walls are joined on to old, it is usual to take out a brick or part of a brick from every alternate corner of the old work, in order to *tooth in* the new work; and these toothings are left in the first building when it is intended to join new work to it. In many cases, also, strips of iron hooping are laid in the horizontal joints, to afford a further bond or tie between the old and new B. B. is measured by the *rod* of 272 superficial feet. *See* Richards, *Bricklaying and Brick-cutting*; F. Walker, *Brickwork*; Mitchell, *Brickwork and Masonry*.

Bride (Teutonic word; O. Eng. *bryd*), a term used of a woman about to be married, also during the first year of her married life. With it are associated many other words, such as 'bridge-groom,' 'bride-bell,' now known as 'wedding-bell,' etc. In former times the friends assembled in the church porch, to throw grains of wheat over the bride; later, small cakes were used instead of wheat, which in time developed into the large cake which is the custom of the present day.

Bride, St., *see* BRIGIT, ST.

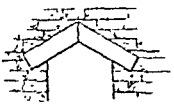
Bridel, Philippe Cyriaque (1757-1845), Swiss writer, better known as the 'doyen Bridel,' was successively pastor at Bâle, Château d'Oex, and Montreux. As his *Poésies helvétiennes* were pub. in 1782, he may justly be considered the first Vaudois poet. He is celebrated for his delightful, if not always accurate, descriptions of his travels, and especially of the peasants and his wanderings over the Alps. His style is refreshingly simple and unaffected, and all his work glows with the warmth of patriotic sentiment. His *Course de Bâle à Bienne par les vallées du Jura* appeared in 1789, whilst much of his descriptive

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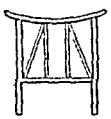
in Blackfriars, London, which once was used as a workhouse and home of correction. The name is derived from a well dedicated to St. Bride, and from which the par. of Bridewell is called. The hall and treasurer's house are practically all that is left of the original building.

Bridge, strictly, is a construction which provides a continuous path or road over water, valleys, ravines, or above other roads. The term is applied also to cases in which some part of the B. is temporarily removable, or in which a suspended platform con[illegible] passengers or goods across a [illegible]e; those carrying water are [illegible]ed aqueducts. There is no re[illegible] of the earliest B., which probably consisted of a wind thrown tree trunk spanning a stream. Timber being readily worked by primitive tools, was, no doubt, the material first used for the construction of Bs. by art—simple beams on natural piers or supports. The making of artificial supports would, where needed, follow. Herodotus speaks of a B. of this type across the Euphrates at Babylon, consisting of beams resting on stone piers—ascribed to the time of Semiramis, 2230 B.C. The span of a simple beam B. being limited to the length of timber available, or capable of being handled by crude appliances, some form of truss construction would develop in course of time, probably a long time. Trussed construction in which pieces of timber are arranged as a stable frame was known in Egypt in the 20th dynasty 1200 B.C., evidence of which is found

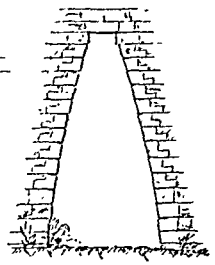
in existing examples of the trussing of the parts of light domestic furniture of that era. It is interesting to note that though the Egyptians at *that time understood* the use of a truss, and were great builders in masonry, they made little use of the arch at any period, the nearest approach to this of early date is the placing of two inclined stones to abut



ARCH. Cᵗ PYRAMID

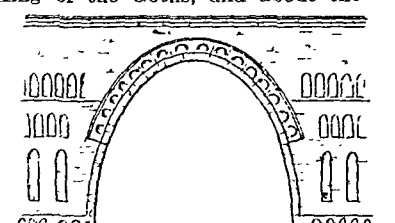


TRUSS. ECYPTIAN



PALENQUE. Cᴬ AMERICA.

against walls at their lower ends, and against each other at their upper ends in the middle of the opening, as seen in the Great Pyramid, 4000 B.C. Later they made some use of a true brick arch, for underground work only. In Chaldea, arches of unburnt bricks have been found dating from 4000 B.C., while at Tell-lo, in Babylonia, burnt bricks were adopted for the same purpose. Existing basreliefs from Assyria, of 880 B.C., show that semicircular arches were used over gateways. The Greeks do not seem to have used the arch, though they represented it upon sculptures; possibly they distrusted it, for as an old Hindu proverb says, 'an arch never sleeps.' Mexican remains, of 1000 B.C., at Palenque show constructions suggestive of the arch, but are in reality corbelled work, the arrangement of the stones plainly indicating the corbel principle. Under Etruscan influence there was built in Rome, 600 B.C., the Cloaca Maxima, having an arched roof of semicircular form. 15 ft. span at its wider end. The evidence as to an early knowledge of arch-construction is conclusive, though not yet as applied to Bs. An instance, which by the size of its arches implies a yet earlier knowledge of masonry applied to this use, is that of the B. (Pons Milvius) built a short distance from Rome, 100 B.C., which appears to have had spans of from 50 to 80 ft. Upon Trajan's column (A.D. 100), there is represented the B., built by him across the Danube. Great doubt exists as to the width of openings, which were spanned by timber arches, but as the piers are said to have been 150 ft. high, these were no doubt considerable—Gibbon says over 100 ft.—as masonry arches would probably have been adopted for a more moderate span. The Romans were indeed from this time forward great B. builders, many of their works (if we include aqueducts) are still in use, or at least standing. The semicircular arch was with them the rule. That it was possible to build arches of forms other than this, though perhaps not unknown by the Roman engineers, began only to be appreciated early in the Christian era, first appearing in the architecture of buildings, in archways, and domes. In Persia, the palace of Terbutan had a dome of elliptical form, A.D. 350. The palace of Ctesiphon, near Bagdad, had an arched hall 86 ft. wide of a parabolic figure. Though applied to buildings, these works furnish proof that it was understood the semicircular form need not be slavishly adhered to, though in the construction of masonry Bs. it was long before any other than the circular arch came into use. With the decay of Roman power, and the arts fostered by Roman wealth, the construction of Bs. in a measure lapsed, till the great revival in Italy 1000 years later. The art was not, however, entirely lost, for in 741 an aqueduct of great height, having ten noble pointed arches, each 70 ft. span, was built at Spoleto by Theodoric, King of the Goths, and about the



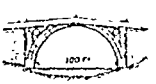
ARCH - PALACE OF CTESIPHON

year 1000 an arch of 120 ft. span was thrown across the river Serchio. The originality and boldness of the early builders is well illustrated by the arched B. of 184 ft. span, rising 60 ft., built in 1454 over the river Allier in France, and by the great arched B. of 251 ft. span over the river Adda, of the latter part of the 14th century, later destroyed by Carmagnola. Regard for beauty is shown by such

examples as the Trinita [illegible] spans at Florence, by [illegible] 1566, having a centre arc [illegible] and the Rialto B. by Antonio da Ponte, Venice, which has a segmental arch of 91 ft. span. In Great Britain although the nicest refinements in Gothic art were practised from the advent of that style, in B. building, structures were of rude design, first in timber, later with stone piers of great width, carrying arches, generally of semicircular, segmental, or blunt pointed form. Occasionally, as in old London B. (1200), chapels formed a part of the structure, and in this case, later, houses also were added on either side, between which the traffic made its way. Compared with structures built about the same time in other parts of Europe, London B. was a poor achievement, celebrated rather because of its associations, than as an example of B. building. There were also in this country numerous other Bs. in masonry, constructed, from about the date of London B., generally of small span as to the openings, and, where crossing rivers, ill founded. There was indeed no sensible advance in B. building between the years 1200 and 1750, at about which date old Westminster and Blackfriars Bs. across the Thames, by Labelye and Milne, respectively were commenced. The first of these is of note because of the method of founding the piers, by caissons or coffers, with a bottom which remained as part of the structure, and sides which were detachable; the second is of interest because it appears to be the first instance in this country of the use of the elliptical arch, which gave rise to a widespread discussion between mathematicians and others, in which Dr. Johnson took part, as to the practicability of constructing such an arch, notwithstanding that Ammanatis B. had been standing near 200 years. Both Blackfriars and Westminster Bs. failed eventually by sinking of the piers. They are otherwise noticeable as having been the occasion for the use of centerings of remarkable skill, designed by Kung. A B. of a single arch was about this time being built at Pont-y-Pryd in Wales, of 140 ft. span. by Edwardes, who succeeded after two attempts ending in disaster. Smeaton, who built many Bs., experienced the same difficulty as Labelye and Milne, with his foundations, which led to a grievous failure in the case of the Hexham B. The fault at this time was chiefly the inability to found in water of any depth, perhaps a failure to appreciate the necessity for going deep into the river bed. The best known examples of more recent times which may be [illegible] pletely successful are [illegible] ondon and Waterloo both fine structures having elliptical arches of granite, that at the centre of London B. being 152 ft. span. The largest masonry arch in this country, and when built, the largest in the world, is that of the Grosvenor B. at Chester, 200 ft. span, built in 1833 by Hartley. This has long since been eclipsed, first in America, by the Cabin John aqueduct B. of 240 ft. span, later by the Luxemberg B. in Germany of 277 ft.,



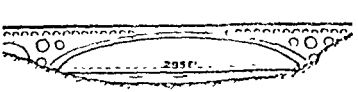
WITTENCEN



COALBROOKDALE



SOUTHWARK



PLAUNEN



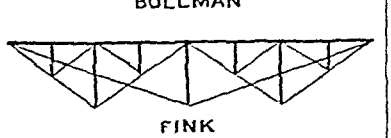
STEIN TEUFEN

and by the Plaunen B. of 295 ft., built by Leibold in 1903, which now holds the record for width of span. Bs. in timber of any but small dimensions do not seem to have been constructed, except the solitary instance of that near Rome, A.D. 100, till about the middle of the 18th century, when the Wittengen B. of 390 ft. span was built by the brothers Grubenmann. The Schaffhausen B., by the same constructors, had two spans of 193 and 172 ft. respectively. Both these Bs. were of truss design. A B. of timbers arranged to form a somewhat flat arch of 208 ft. span, with stone abutments, was in 1809 built over the Regnitz, near Bamberg.

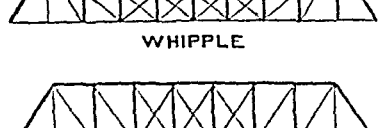
Timber is not now used for large spans even where it is plentiful, the liability to decay, and difficulty of adequate repair, making it unsuitable for any but moderate openings, for which it still finds favour in America and Australia. Bs. formed of boats, or pontoons, connected by timbers, were used in early times. Xerxes crossed the Hellespont by this means in 450 B.C., and there are still in use Bs. of this description. Suspension Bs., in which a floor is hung from, or carried upon, ropes or chains, are said to have been used in China at a remote date, and were certainly in use by the Incas of Peru, up to 200 ft. span, in the 16th century. In this country the first was constructed in 1741 for foot passengers only, having old pit chains suspended between the rocky sides of the river Tees at Middleton. The design of suspension Bs. has received great attention, some of the largest spans being so formed with such improvements as were introduced at a later date. One of the earliest Bs. of note of this kind is the Menai Suspension B., 1819, of 570 ft. span, by Telford, and the latest are those crossing the East R. at *New York, the Brooklyn, Manhattan*, and Williamsburg, having centre spans 1596, 1470, and 1600 ft. respectively. The last named has steel wire cables 18¾ in. in diameter, dipping 176 ft., and supporting a deck 118 ft. wide. The first attempt to build any sort of metallic arch was that at Lyons in 1755, finally abandoned, and the first carried to completion, the B. at Coalbrookdale, a semicircular cast-iron arch of 100 ft., still standing. It was designed by Pritchard, no doubt assisted by Wilkinson, an ironmaster who strongly advocated iron for many uses. Thomas Paine, author of the *Rights of Man*, having endeavoured in 1787 to secure the construction of a cast-iron arched B. over the river Schuylkill, some of the ribs were cast at Rotherham, and the project being abandoned the material was used for the arched B. of 236 ft. span across the river Wear at Sunderland, finished in 1796. Southwark B. over the Thames, by Rennie, completed in 1819, has three spans, the largest being of 240 ft. It is now on the point of being reconstructed in order to improve the road gradients. Cast-iron girders, a form of construction to resist transverse loads (as in timber beams) were first applied to a B. of three small spans by George Stephenson in 1823. By bolting together, and trussing with wrought-iron rods girder spans of cast iron were finally increased to 100 ft. In wrought iron girder construction, having the material disposed with some regard to efficiency, the earliest known examples are due to William Handyside, who some years prior to 1847 had used such girders for buildings in St. Petersburg. In B. construction the first serious use of wrought iron was by *Fairbairn, for Vignolles*, in 1847 in a railway B. of 60 ft. span. This B. had three built up girders of box form, carrying a timber floor. Following this, in 1850, was completed the Britannia Tubular B., having four spans, two of 460 ft., and two of 230 ft. each, the traffic passing through the two tubes, which lie side by side. The engineers responsible for the design were Robert Stephenson, Hodgkinson, and Fairbairn, assisted by Clark. This work, with the experimental investigations which preceded it, decided the claims of wrought iron to consideration, but the tubular type of construction has been but little imitated, the chief instance being the B. over the St. Lawrence at Montreal, 7000 ft. long. The box or cellular form of girder construction was soon succeeded by the simple web plate girder for spans of moderate extent, this type is still *very widely adopted, and has of late* years been favoured by American engineers for spans up to 120 ft. Bs. having wrought-iron girders of triangulated form, came into use in the middle of the last century, the first notable example being the Newark Dyke B. by Wild, 1852, of 259 ft. span, carrying two lines of railway. The top booms of these girders were made of cast iron, as also the struts, or members in compression, all tie members, including the bottom boom, being of wrought iron. This composite system of construction was soon abandoned in favour of all wrought iron for the girder work, though the simple triangulated design known as the Warren girder was much used, and is still occasionally chosen for moderate spans. In 1859 was constructed Brunel's great B. at Saltash, having two spans of 455 ft. The top boom is of hollow elliptical section, of cast iron, and arched *from* end to end The bottom member of reverse arched form, is of wrought iron, the two being braced with vertical and diagonal members. The B. is still in use. Concurrently with the development of open web girders in this country there were being evolved in America various types of trusses, partly of iron, and partly of wood, later wholly of wrought iron, which, beginning with the Howe and Bollman trusses in 1840, were followed by the Pratt truss in 1844, the Fink truss in 1851, and by the Whipple in 1852. Of these the Whipple and the

Pratt are still largely used, perhaps the largest number of girder Bs. above 100 ft. span being of the last-named type. It is interesting to note that Palladio, about 1560, had proposed and perhaps used trusses, of course in timber, which closely resemble the Pratt type. In the accompanying diagrams indicating the forms of the various trusses, thin lines show members in tension, thick lines those in compression. The largest girder spans yet constructed occur in the St. Louis Municipal B. crossing the Mississippi, which has three spans each of 668 ft., carrying a double deck, with two railway lines and a road for vehicular traffic and passengers. The girders are 110 ft. deep at the centre, reduced towards the ends, having Pratt bracing, with subsidiary members. The piers founded on caissons reaching rock about 137 ft. below high-water le[illegible] The total weight of steel-work, including approaches, is 23,200 tons. In each of the girder spans complete there is 4250 tons of steel, exclusive of piers. Considerable saving was effected by the use of nickel-steel in a great part of the trusses. The total cost of the three main spans, with the four supporting piers, is £410,000. The engineers responsible for the design are Messrs. Boller and Hodge. From arches of cast iron already dealt with, to arches of wrought iron would seem but a step, yet it was not till 1864 that a wrought-iron arch B. of importance was constructed, when there was built a B. of three spans crossing the Rhine at Coblentz, having openings of 315 ft. The ribs are of open work design rising a part of their height above the road level. In 1874 was completed Captain Ead's great B. over the Mississippi at St. Louis. This is of three spans, 502, 520, and 502 ft., the centre arch rising 47½ ft. The arches are formed of open triangulated ribs, supporting the roadway by vertical columns at the apices of the arch bracing. The general appearance is very fine. This is one of the earliest instances of the use of steel on large B. work, though for small Bs. it had been used in this country in 1861. Other Bs. of importance are the Douro Viaduct by Seyrig of 525 [illegible] shaped arche[illegible] ing. The Via[illegible] span, having hinges at the crown and at the springing, and the Niagara Falls B., replacing in 1897 an earlier suspension B. The span of this arch, which is hinged at the springings only, is 840 ft. Cantilever Bs., in which the structure of the B. is carried out from either side towards the middle of the opening, where the projecting ends are connected by an intermediate girder span, were in a crude form known in very early times by the Chinese, being constructed in timber. Of modern examples may be mentioned the Sukkur B., over the river Hooghly, 1889, of 820 ft. span, carrying a single line of railway, and the Forth B., completed in 1890 by Baker. This B. has two main spans of 1710 ft. each. There are three cantilevers, connected over the principal openings by independent girder spans of 350 ft. The length from end to end of the cantilevered part of the B. is 5330 ft. The middle part of each complete cantilever rests at four points, those of the mid cantilever which occurs at the island of Inch Garvie, being in the direction of the B.'s length 260 ft. apart. The [illegible]nvincing [illegible] in this [illegible]ow under construction over the St. Lawrence at Quebec, which is of cantilever form, having a centre span of 1800 ft., the cantilevers resting upon points, and deriving their whole stability from the land anchorages upon the shore. The Blackwell Is. B. by Ingersoll, recently completed, consists of five spans of cantilever construction, the second and fourth spans are of 1182 and 984 ft., the centre or island span of 630 ft. being continuous from pier to pier and projecting to the centre of either river span, where it connects to the ends of the shore cantilevers. The end spans of about 460 ft. are the overhanging ends of the shore arms. The soffit of the B. is sensibly straight, the top of the girders following indifferently well the moment curve proper to this form of construction. The four chief types of Bs. for large spans, in which girder, arch, cantilever, or suspension principles appear, may be adopted for spans increasing in the order named. The choice of type is influenced greatly by considerations of economy, having regard to peculiarities of site. As types there is not a great deal to choose between them for spans from 300 to 700 ft. Beyond this the last two named are, with r[illegible] [illegible] For very large [illegible] of the suspe[illegible]ss apparent, and if the anchorages are readily effected may be the most economical. In any large B. the amount of moving or live load per foot run of B. has a greater influence on the question of economic type than the type itself on its merits as a type. Opening Bs., in which a part of the structure is temporarily removed to leave a clear opening over water, or to make a break in the

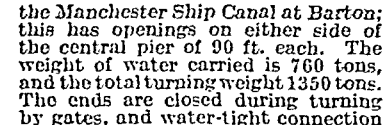
road for purposes of defence, are many hundred years old, and in the early form consisted of means provided to raise by chains a short length of B. floor. But Swing Bs., in which some part of the B. turns upon a pivot, the weight perhaps supported by rollers, are hardly more than a century old. This type is largely used, and has been applied to give a free opening of as much as 500 ft., as in the great swing span over the river St. Lawrence, carrying two railroads, a trolley track, a carriage road, and footways. A swing B. carrying 234 ft. of the Bridgewater Canal crosses



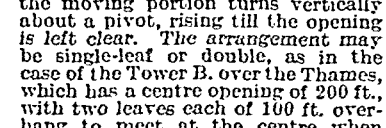
HOWE



BOLLMAN



FINK



WHIPPLE

PRATT

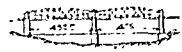
the Manchester Ship Canal at Barton; this has openings on either side of the central pier of 90 ft. each. The weight of water carried is 760 tons, and the total turning weight 1350 tons. The ends are closed during turning by gates, and water-tight connection to the canal ends proper is made by a rubber faced wedge device operated by hydraulic rams. In Bascule Bs. the moving portion turns vertically about a pivot, rising till the opening is left clear. The arrangement may be single-leaf or double, as in the case of the Tower B. over the Thames, which has a centre opening of 200 ft., with two leaves each of 100 ft. overhang to meet at the centre when down. In Rolling Bs., of which the Schertzer variety is best known, the opening part of the structure is formed with a rounded end suitably ballasted, upon which the opening part is caused to roll backwards till the span assumes an upright position, no longer obstructing the waterway. The heaviest opening B. of this kind now in course of construction, at Keadby in Yorkshire, will be of 3000 tons weight. In Traverser Bs. that part of the structure crossing the space to be occasionally freed is made to roll bodily backwards, telescoping within itself, with suitable mechanical arrangements to meet the difficulty presented by coincidence of road surface on the moving, and the fixed portions of the B. A structure of this kind crosses the river Dee. Transporter Bs., of which many now exist, have an overhead arrangement of horizontal girders, or some form of stiffened suspension B., at a sufficient height to give the desired headway, with a platform suspended therefrom, which, accommodating vehicular and passenger loads, is drawn across from side to side. Of this kind the Runcorn Transporter B. over the Mersey, by Webster, is an example, having a clear opening of 1000 ft. Bs. used in military operations are constructed chiefly of timber, and are formed of plain or trussed beams, which may be supported by trestles. Cantilever and suspension types are used for larger spans, and for crossing wide rivers are commonly of the floating description. The paramount condition is ability to erect quickly. During the last hundred years founding in water has received great attention; till then piling, where a river bed was soft, or loose, was occasionally resorted to, or, to lay bare a portion of the bed, cofferdams were adopted. These were commonly made of double rows of piles, rendered watertight by clay puddle. Later, close piling, grooved and tongued, was used, particularly in cases where wide obstructions in the river were objectionable. Cylinder piers of iron or steel are frequently sunk by excavating in the interior, the bottom being open, by mechanical grabs working below water, or the cylinder being in clay, by pumping out the contained water and working in the dry. Where the strata is permeable the top of such a cylinder may be closed, and a lock having double doors being provided, the interior air is put under pressure just sufficient to exclude the water. This, the pneumatic method, is applied also to boxes or caissons of considerable size, a recent example being the S. caisson sunk for the Quebec B., which goes down 110 ft. to solid rock. In

the deep sands of Indian rivers, brick cylinders are much used for B. piers, these being hollow have strong steel curbs around the bottom edge, and sink by their own weight, assisted, it may be, by supplementary loading at the top. The enclosed sand is commonly removed by grabs, and the interior finally filled with concrete. In America caissons are occasionally made of timber, or timber is used for what is known as crib work, in which massive constructions are framed together and loaded with stone to sink and form a solid base. The cost of B. piers in relation to the spans supported by them is important. The more costly it is to construct piers the greater should be the spacing between them for economy. The object generally is to adopt such openings as will make the total cost a minimum. This is achieved when there is equality in the rate of variation due to span, of the cost of the piers and the cost of the superstructure, both reckoned at per foot run of the B., and for girder Bs. is generally, but not of necessity, secured, when the total cost of piers equals the total cost of the main girders. Looking backwards and considering methods of design, it may be said there is no information available as to how the engineers of ancient times developed the capacity to build so well as they did—by what reasoning they reached the forms and proportions adopted. It is known that old peoples had considerable knowledge of astronomy, of geometry, and some other branches of mathematics, and it may be supposed they were acquainted with the laws affecting construction, but this is not probable: what scientific knowledge they had was largely abstract in its nature, and though the state of the constructive arts indicates skill, the skill displayed is not so marked as to postulate advancement in any measure approaching that which now obtains. It is probable that in B. building as in other arts much was learned by trial, by failure. To conclude that the methods used were scientific in the sense now understood, because fine examples of work yet remain, would be to ignore the likelihood of many failures, failures as little foreseen, as any certainty of success. Without knowledge of the computation of stresses, a knowledge of the resistance of materials to stress would be of little use, yet it is reasonable to think some principles of construction may have been perceived and applied in practice. As to the strength of solid beams, it is probable that the fact of a beam's strength increasing at a more rapid rate than the beams depth simply, was known long since, though the precise laws governing this may have been unknown. It is an elementary fact to-day that a loose cord, hanging between supports and loaded in a particular manner, will assume a particular form, and that this corresponds to the form which must be given to an arched frame similarly loaded to ensure equilibrium, corresponds, in fact, to the form of an arch which shall be stable, and if of sufficient thickness, safe. Though the ability to calculate, or lay out such a figure was probably wanting, yet the perception of a connection between a loaded cord, and an arch ring similarly loaded may have been perceived, and applied by experiment to solve some of the problems occurring in arch and dome construction. It is inevitable that the nature and effects of tensile, compressive, and transverse stress should have been appreciated in some degree —the skill with which the Egyptians framed together articles of domestic use makes this apparent. Coming to later times, but before the enunciation of any definite principles of statics, the nicety with which the Gothic builders adjusted resistance thrust to, makes it probable enough that some method of reasoning or of experiment must have been applied, together with the exercise of judgment trained by constant use, at a time when routine methods of computation of any nicety were certainly wanting. The first [illegible] any attempt [illegible] of strength [illegible] l in the effort of Galileo in 1638 to formulate the laws governing the transverse strength of rectangular beams. He reached the conclusion that this varied as the breadth, and as the square of the depth, and though right to this extent fell into error in assuming rigidity of material up to the point of rupture, which was thought to occur by yielding to tension from the top edge of the beam downward, placing the neutral axis, as now termed, at the top of the section. It is most likely that Galileo understood that this was not strictly true, but stated his [illegible] first rough [illegible] n. The law [illegible] stress and strain, *i.e.* between force applied and yield resulting was discovered by Hooke in 1660, and published 1678. This, the great fundamental principle upon which all modern design may be said to rest, was not at first fully appreciated. Mariotte, resorting to experiment, established that beams under transverse load were subject to compressive stress in the upper part, and tensile stress in the lower, and

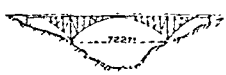
perceiving that there must be some part between the upper and lower surfaces at which change of stress would occur, arbitrarily assigned this to the centre of gravity of the section, in which he happened to be right. James Bournilli, studying the flexure of beams between 1694-1705, was the first to construct what are known as stress-strain curves, a graphic method of displaying the relationship of stress to strain, but was not wholly correct in his conclusions. Parent in 1713 perceived that in any beam the total stress above the neutral axis must equal that of contrary kind below, fixed the position of the neutral axis as being coincident with the centre of gravity of the section, and showed that stress varied uniformly from the neutral axis outwards. Coulomb in 1773 reannounced Parent's conclusions, it is supposed with no previous knowledge of those conclusions. Finally, Saint-Venant gave a complete mathematical analysis of beam phenomena as now understood. The determination of stresses in framed and other structures, began, it may be said, with the discovery by Galileo of the funicular curve, which has already been referred to as a curve of equilibrium in connection with arch structures, but the studies of investigators were for fully a hundred years from Galileo's time confined chiefly to the determination of the loading proper to particular curves, finding in this scope for mathematical analysis of high order. Parent, towards the end of the 17th century, ascertained the precise loading neces-



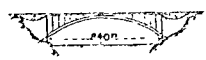
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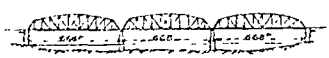
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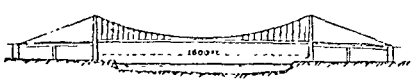
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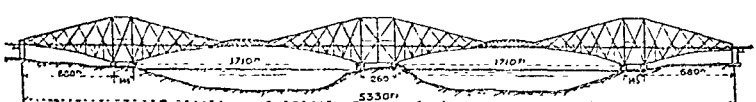
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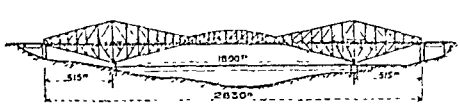
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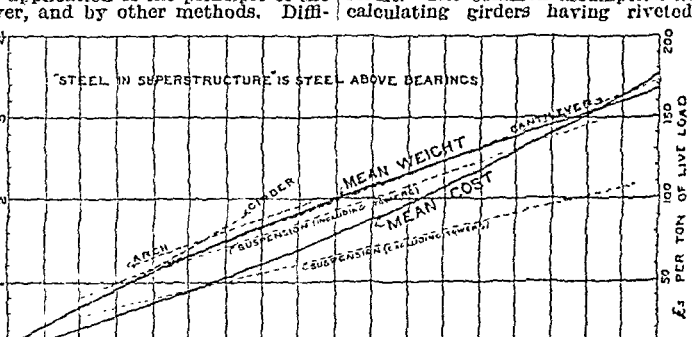
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sary to simple stability of the semi-circular figure, and defined the catenary curve. These studies were supposed to have a bearing upon the correct design of arches, but being pushed to theoretical extremes, with little regard to actual conditions of thick arch construction, were of little value. More practical investigations into the theory of arches were later pursued by La Hire, Coulomb, and Moseley. The resolution of forces has been known as a simple theorem from the time of Galileo, to whom it is due, but Whipple was perhaps the first, in 1846, correctly to analyse the

stresses in a truss. The first really convenient graphic [illegible] principles [illegible], who established in [illegible] of reciprocal figures by which, given the form of a frame (with certain limitations) and the direction and amount of the forces acting upon it, a diagram may be drawn to a definite scale, which gives, by the length of its *lines*, the amounts of the stresses in the frame; this, with a simple system of lettering the parts for ready identification, due to Bow, renders a graphic solution a comparatively simple matter in cases where the stresses are determinate by static principles. The stresses in a frame may, with the same reservation, be determined by an application of the principle of the lever, and by other methods. Difficulties arise in cases where the frame is not statically determinate, where a girder in one length rests upon more than two supports, and in elastic arches with less than three hinges. Various methods are in use for dealing with questions of this character. Without some simplification of the conditions really obtaining, calculations of this kind are apt to be involved or impracticable, and the tendency is to avoid methods of construction which render such computations necessary, with the lasting disadvantage of possible injury resulting from displacement of foundations. On the other hand, in the case of arches, the disuse of hinged bearings at the springings and at the crown is favourable to general stiffness of the structure. It has been said that the determination of stresses in the members of a structure would be valueless without some knowledge of the behaviour of materials under stress. The earliest experiments in this direction were crude and unreliable, but tests of value were made by *Tredgold*, *Barlow*, *Fairbairn*, Hodgkinson and others; the whole study is barely a hundred years old. In recent years a vast amount of careful experimental work, continued to destruction, has been carried out upon materials as such, and upon the parts of structures, particularly upon strut members, and riveted joints, and upon structures to a large scale. Numerous tests of the elastic deformation of parts of Bs. have also been made, with a view to ascertain what difference there may be between the observed and the calculated result. The common assumption in calculating girders having riveted connections, that the connection is as though hinged, is not strictly satisfactory, and though leading to but little error in frames having slender members, results in great uncertainty as to the nature and amount of the stresses at the connections, and in the members of a frame, where these are of exceptional breadth. This, though not satisfactory, does not appear in practice to lead to any inconvenience. It is probable that in wrought iron, and more so in steel, any considerable secondary stress which may be developed when the structure is new, is in course of time modified by yield of the parts, the ultimate condition of the metal under strain or deformation which is not progressive, being in no sense prejudiced. The effects of variation and reversals of stress in structural materials have been patiently studied, notably by Wöhler and Bauschinger, with the



WEIGHT OF STEEL IN SUPERSTRUCTURE AND COST OF COMPLETE BRIDGE PER TON OF LIVE LOAD CARRIED

broad result for steel that resistances to stress of constant amount—to stress varying between zero and a maximum of one kind (tension or compression)—and to stress varying between maxima of differing kinds, are proportional to three, two, and one. Much attention has also been given to the effects of impact, which is now commonly covered by percentage allowances added to the known live loads, these allowances being based upon experience and judgment rather than upon any strictly rational considerations. As the span of Bs. increases, the weight of that part of the structure devoted to carrying the load from side to side increases at a somewhat rapid rate. For small structures, the weight of supporting girders, for instance, may be little compared with the load supported, but in the case of large spans the structure itself may greatly exceed the weight of the load carried. The cost also rises for large spans even more rapidly. To illustrate this, the diagram given displays the weight of steelwork in tons, and the cost in pounds, per ton of live load carried, for various spans up to the limits of present practice. The curves show broadly correct results based on actual examples, but it is to be observed that particular cases of small span may give results differing considerably from the mean. The design of small Bs. is commonly a simple matter, the practice in such structures is so well understood as to give no special trouble, but the labour involved in works of magnitude, or of exceptional difficulty, may be extreme. To illustrate this, particulars relating to the Forth B. are to the point. The work of design and detailing covered about nine years, a great part of this being concurrent with the progress of the work. The staff of engineers and draughtsmen employed appears to have been about twenty, and the cost, exclusive of chief engineer's fees, about £28,000, with rents and general office charges additional: this corresponds to about 10 shillings per ton of steelwork in the structure. In recent years there has become available for B. construction the composite material, reinforced concrete, in which bars either round or of special section are used in combination with concrete of exceptional density and strength, the chief function of the steel being to resist tensile stresses and of the concrete to offer resistance to compression. Solid beam Bs. in this material are now largely used in America, and arches of considerable size. The Stein Teufen B., Switzerland, with a span of 259 ft., may be named as a fine example, and the Sergolomento B. in Rome of 328 ft. span as the largest yet built in this way. In France girders of the Pratt and bowstring type have also been constructed, but for Bs. in this country it finds little favour, though occasionally used for highway purposes, in which as a rule, heavy and quick moving loads are infrequent. For railway Bs. some doubt exists as to whether the vibration caused by heavy locomotives may not reduce the grip of the concrete upon the steel, which if it occurs would be serious, but there appears no evidence of this in reinforced concrete structures designed with liberal margins, and if this apprehension is not justified, this material would be economical in maintenance, as in first cost. It is not, however, in railway work, adaptable to alterations or reconstruction, such as is frequently necessary with growth of traffic, or for other reasons, as no reinforced concrete structure is fit to carry its full load till many weeks after being built. —W. H. THORPE.

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Bridge, a card game developed from whist and introduced about 1894. The cards are dealt as in whist, except that the last card is not exposed. The dealer has the privilege of declaring what suit constitutes trumps, and he is influenced by the different scoring values of the various suits. Spades count 2 points for every trick above 6, clubs 4 points, diamonds 6 points, hearts 8 points, and no trumps 12 points. After considering his own hand, the dealer may leave the duty of declaring trumps to his partner, but no further communication than the bare words 'I leave it' is allowed. When trumps have

been called, the 'leader,' or opponent on the left of the dealer, may 'double' the value of each trick, or, following him, the third player may exercise that right. In case of a double, the dealer or his partner may 'redouble,' which means that the value of a trick is quadrupled. This again may be doubled, and so on until a maximum of 100 points a trick is reached. After the leader has played his first card, the second player, or 'dummy,' lays his hand face upwards on the table and takes no further part in actual play, the dealer playing both hands. Otherwise play proceeds as in whist. The scoring is recorded on paper ruled with two vertical columns crossed by a horizontal line about half way. The values of tricks above 6 are scored below the line to either side, while above the line are scored honours, chicane, and points for grand and little slam. The honours consist of ace, king, queen, knave, and ten of the trump suit, and for three or 'simple' honours a side scores the value of 2 tricks; for 4 honours, 4 tricks; for 5 honours, 5 tricks; for 4 honours in one hand, 8 tricks; for 5 honours, 4 in one hand, 9 tricks; for 5 honours in one hand, 10 tricks. In no trumps, aces are counted as honours 3 counting 30 points, 4 counting 40 points, and 4 in one hand 100 points. 'Chicane' means the absence in one hand of any trump cards; the side possessing the hand scores points equivalent to simple honours. If all the tricks are taken, 'grand slam' is recorded, counting 40 points; if all but one are taken, 20 points are scored for 'little slam.' A game is concluded when one side completes 30 points below the line, and a fresh game starts. The first side to win two games is awarded the rubber, for which 100 points are scored in the honour column. The total score is arrived at by adding *all points above and below the line.*

Three-handed bridge.—When three persons play, four hands are dealt, the dealer playing his own and dummy's. If the dealer 'leaves' the declaration, the trump is determined by the constitution of dummy's hand. If there are 3 aces, 'no trumps' must be called; otherwise the longest suit constitutes trumps. If two suits are of equal length, the pips are counted, *ace counting eleven* and other honours ten each. If two suits are still equal, the suit of higher scoring value becomes the trump suit. Only declarations which are won are scored below the line; the opponents score above the line if the declaration is lost, together with honours, etc., as in ordinary B. 50 points are scored in honours for each game, and 50 more for the rubber.

Auction bridge.—In this popular modification for four hands, the dealer *must* declare the trump and his ability to take a stated number of tricks above 6. The opponent on his left may pass, double, or increase the call. An overcall means a declaration to take tricks of higher total value, but more tricks in a lower suit may constitute an overcall even if the value is only equal; thus, a two-club call takes precedence of a one-heart call. The next player to the left then passes, or doubles, or redoubles, if his partner's call has been doubled, or bids higher still. The bidding or doubling continues until all are satisfied, when the final declaration determines trumps and that partner who originated the call in that suit becomes 'dealer,' and his *vis-à-vis*, 'dummy.' Doubling does not affect declarations, but only the score. If the declaration is won, the winners score the value of tricks above 6 below the line. If the declaration has been doubled, a bonus of 50 is scored in the honour column, and 50 points for each over-trick. If the winner or his partner has redoubled, the bonus is doubled. If the declaration fails, nothing is scored below the line, but the adversaries score in the honour column 50 for each under-trick, or 100 or 200 if the declaration has been doubled or redoubled. The loss on a one-spade declaration is limited to 100 points. Honours, chicane, slams, etc., are scored as in ordinary B. The tendency of auction B. to force itself always to a no-trump declaration has led to a 'new count,' in which spades count 2, clubs 6, diamonds 7, hearts 8, 'lilies' or royal spades 9, no trumps 10. It is seen that a new suit makes its appearance, spades counting as a low suit for a defensive call, or as lilies or royal spades, superior to hearts, at the option of the player. He may bid first in spades, and later increase to royal spades. The general result of the new count is to equalise the values of the blacks and reds, and to make it possible to overcall even a strong no-trump declaration. 250 points are added for rubber.

END OF VOL. II

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